SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

Uroleucon bereticum (E.E. Blanchard) (Hemiptera: Aphididae) and Its New Endemic Parasitoid Species (Hymenoptera: Braconidae, Aphidiinae) in Argentina

MIGUEL A. DELFINO[1] AND PETR STARY[2]

[1]*Cátedra de Entomología, Facultad de C.E.F. y N., Universidad Nacional de Córdoba, Avda. Vélez Sarsfield 299 5000 Córdoba, Argentina; e-mail: madelfino@arnet.com.ar*
[2]*Institute of Entomology, Academy of Sciences of the Czech Republic, Branišovská 31, 370 05 České Budějovice, Czech Republic; e-mail: stary@entu.cas.cz*

Neotropical Entomology 33(5):577-581 (2004)

Uroleucon bereticum (E.E. Blanchard) (Hemiptera: Aphididae) e Sua Nova Espécie Endêmica de Parasitóide na Argentina

RESUMO - Indivíduos de *Uroleucon bereticum* (E.E. Blanchard) foram coletados sobre plantas de *Conyza bonariensis* (L.) Cronquist (Ateraceae), no Parque Nacional "Quebrada del Condorito" na localidade de 'Pampa de Achala', Provincia de Córdoba, Argentina. Esa espécie de afídeo havia sido descrita como *Macrosiphoniella beretica* por Blanchard (1922), a partir de fêmeas ápteras vivíparas, sendo que desconheciam-se fêmeas vivíparas aladas. Neste trabalho redescreve-se *U. bereticum*, através das características morfológicas de fêmeas vivíparas ápteras e aladas. Muito pouco se conhece, até o momento, sobre os parasitóides de afídeos na Argentina e exemplares de espécies de afídeos nativos endêmicos não têm sido investigados. *Binodoxys achalensis* Starý, sp.n. é descrita como um novo parasitóide endêmico associado a *U. bereticum*. Há indicações, nesta localidade, da ocorrência de novos e numerosos parasitóides oligófagos.

PALAVRAS-CHAVE: Redescrição, afídeo, *Binodoxys achalensis*, nova espécie

ABSTRACT - Collections of *Uroleucon bereticum* (E.E. Blanchard) on *Conyza bonariensis* (L.) Cronquist were made throughout the National Park "Quebrada del Condorito" at Pampa de Achala, province of Córdoba, Argentina. This aphid species was described as *Macrosiphoniella beretica* by Blanchard (1922) from apterous viviparous female and the alate viviparous female were unknown. Morphological characteristics of *U. bereticum* presented in this paper include the re-description of the apterous viviparous female as well as a new description of the alate viviparous female. Very little is known about the aphid parasitoids in Argentina and material of the indigenous endemic aphid species has not been collected up to now. *Binodoxys achalensis* Starý, sp.n. is described as a new endemic parasitoid species associated with *U. bereticum* and its seems to indicate the occurrence of new and more numerous oligophagous parasitoid guild in the target area.

KEY WORDS: Aphid, re-description, *Binodoxys achalensis*, new species

South American species of *Uroleucon* Mordvilko are of special interest because they constitute one of the very few groups of the main aphid subfamily Aphidinae to have undergone recent speciation on native plants in southern temperate regions, with about 14 endemic, morphologically similar species feeding on native Asteraceae (Zonta de Carvalho *et al.* 1998).

Most of these species were originally described in the genus *Macrosiphum* Passerini (Blanchard 1922, 1932, 1939; Essig 1953, 1956); several of them have not been collected since their original descriptions, which in some cases are so brief that it is difficult to be certain that the species really belong to any of all three major subgenera, *Lambersius* Olive, *Uroleucon* Mordvilko, *Uromelan* Mordvilko, plus the monospecific subgenus *Satula* Olive. The only other subgenus, *Belochilum* Börner, includes a single Old World species: *B. inulae* (Ferrari) (Remaudière & Remaudière 1997).

The division into *Uromelan* ("black-tailed") and *Uroleucon* ("white-tailed") is probably artificial since caudal color, the character used to distinguish the two subgenera, has apparently changed more than once (Moran 1984). The evolution of caudal color, particularly in Old World species,

and the consequences for the usefulness of the division into *Uroleucon* and *Uromelan* are discussed by Holman (1974, 1981a, b). On the other hand, the less pigmented species have been included in the subgenus *Lambersius* by Eastop & Hille Ris Lambers (1976), but this subgenus is not clearly defined and it needs to be reassessed (Zonta de Carvalho *et al.* 1998).

The pale green *Uroleucon bereticum* (E.E. Blanchard) may not belong to the subgenus *Lambersius*, as represented by its type species *Uroleucon erigeronense* (Thomas). *U. bereticum* was described as *Macrosiphoniella beretica* by Blanchard (1922) from apterous viviparous female and the alate viviparous female is unknown.

Very little is known about the aphid parasitoids in Argentina. Starý & Delfino (1987) cited five species plus one new species. There are indigenous species of various origin as well as purposely-introduced species, *Aphidius colemani* Viereck was the most abundant. A comparison of the number of parasitoid species per an aphid species clearly shows that the spectrum is rather poor in the province of Tucumán (Argentina) (Starý & Delfino 1987).

Material of the indigenous endemic aphid species has not been collected up to now and more interest should be paid to the occurrence of the parasitoids in various ecosystems. In general terms, the indigenous endemic parasitoid species (yet not known from Argentina) are associated with the *Nothofagus*-ecosystems. However, the newly described parasitoid is associated with an indigenous *Uroleucon*-species and its seems to indicate the occurrence of new and more numerous oligophagous parasitoid guild in the target area.

Morphological characteristics of *U. bereticum* presented in this paper include the re-description of the apterous viviparous female as well as a new description of the alate viviparous female. Also, a new parasitoid species reared from this aphid species is described.

Material and Methods

Collections of *U. bereticum* on *Conyza bonariensis* (L.) Cronquist were made throughout the National Park "Quebrada del Condorito" at Pampa de Achala, province of Córdoba, Argentina, from 2001 to 2002. Pampa de Achala is a 2000 m high plateau located in the Sierras de Córdoba related with the Andino-Patagonian region by its biocenotic caracteristics. The general aspect of the mountain tops are characterized by rocky terrain covered with grassland associated with shrubby vegetation, it has a cold-temperate mountain climate.

Aphids for morphological examination were preserved in tightly stoppered tubes filled with 65% ethanol. Later, the aphids were prepared following the method for mounting small insects in Canada balsam proposed by Remaudière (1992).

The stems of the plants with the aphid colonies were cut, transferred into a rearing jar and kept under laboratory conditions. Emerged parasitoids were collected and preserved in 70% ethanol.

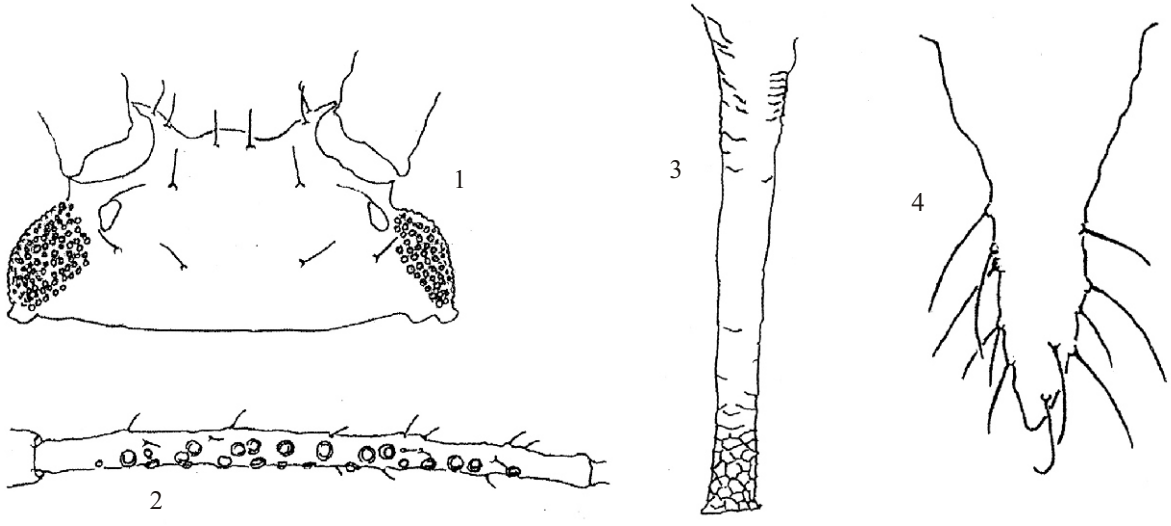
Uroleucon bereticum (E.E. Blanchard, 1922)

(Figs. 1-4)

Alate Viviparous Female

Color in Life. General body color shining pale green.

Color in Cleared Specimens. Head pale dusky, shading to dusky around margins of lateral ocelli. Antennal segments I and II essentially concolorous with head; remainder of antenna except small basal part of segment III dark. Apical rostral segment dark dusky to dark; rostral segment III dusky; remaining proximal segments pale to dusky. Thorax brown. Legs with coxae and trochanters as pale as bases of femora, distal half of femora pale dusky, shading gradually



Figures 1-4. *Uroleucon bereticum*, alate viviparous female. 1 - Head, 2 - Antennal segment III, 3 - Siphunculus, 4 - Cauda.

to dark dusky distally. Tibiae pigmented for entire length, sometimes lighter basally but never as pale as bases of femora. Tarsi dark. Abdomen pale with sometimes inconspicuous pale or pale dusky marginal sclerites; dorsum with distinct sclerites at the bases of the hairs, some of them pale dusky to not evident. Siphunculi dark dusky to dark for entire length. Cauda somewhat pigmented, not contrastingly pale in comparison with siphunculi. Genital and anal plates pale or pale dusky.

Morphological Characters. Body 2.07-2.80 mm long. Head smooth with antennal tubercles developed, divergent (Fig. 1), about 1/2-1/3 as long as antennal segment I and bearing 1-3 hairs. Cephalic hairs with indistinct apices, sometimes transparent and flattened, 0.038-0.054 mm long. Antennal segment I and II smooth; III: 0.55-0.72 mm long, without imbrications on zone around the secondary rhinaria and faintly imbricated on base (Fig. 2); IV: 0.45-0.60 mm long, faintly imbricated on distal half and more strongly so on segments V and VI; V: 0.42-0.53 mm long; base of VI: 0.16-0.18 mm long, and processus terminalis of VI: 0.82-0.99 mm long. Proportions of segments III-VI = 100 (III): 64-87 (IV): 64-77 (V): 23-31 (base of VI) + 126-149 (proc. term.); processus terminalis 2.65–4.00 times as long as base of antennal segment VI. Secondary rhinaria 20-31, irregularly scattered on nearly the whole length of antennal segment III, basal diameter of this segment 0.030-0.036 mm, 0.94-1.06 times as long as the longest hair. Antennal hairs thick with abruptly pointed apices on segment III, about 0.028-0.036 mm long. Rostrum reaching to second coxae; ultimate rostral segment 0.14-0.15mm long, 0.95-1.06 times as long as segment II of hind tarsus, and bearing 6-8 accessory hairs.

Length of hind femora 0.75-0.96 mm, of hind tibiae 1.49-1.77 mm; 0.34-0.45 and 0.63-0.84 times as long as body length, respectively; ratio hind tibiae / femora 1.76-2.00. First tarsal segment with 3-5 hairs, length of hind tarsal segment II 0.13-0.15 mm. Dorsal abdominal hairs like the cephalics ones. Eighth abdominal tergite with four hairs, 0.050-0.068 mm. Siphunculi slightly enlarged at the base, otherwise cylindrical, imbricated on basal portion and below the apical reticulations, remainder almost smooth (Fig. 3), 0.42-0.58 mm long, distal 0.08-0.12 mm reticulated (0.19-0.23% of the siphunculi length), about 0.20-0.26 of the body length, 0.76-0.87 times as long as antennal segment III, 1.60-1.79 as long as cauda. Cauda slender, acuminate, 0.24-0.35 mm long, bearing 13-17 hairs on apical two-thirds (Fig. 4).

Apterae Viviparous Female

Color in Cleared Specimens. Differs from the alate in having pale head and thorax.

Morphological Characters. Body 2.05-3.05mm long. Antennal segment III 0.64-0.80 mm long, basal diameter of this segment 0.030-0.036 mm, 0.79-1.06 times as long as the longest hair; IV: 0.47-0.58 mm; V: 0.39-0.51 mm; base of VI: 0.15-0.18 mm and processus terminalis of VI: 0.82-1.00 mm. Proportions of segments III-VI = 100 (III): 68-83 (IV): 61-71 (V): 22-26 (base of VI) + 123-138 (proc. term.); processus terminalis 4.88-5.65 times as long as base of antennal segment VI. Antennal hairs with indistinct apices, on segment III about 0.034-0.038 mm long. Secondary rhinaria 21-27, irregularly distributed over nearly the whole length of antennal segment III. Ultimate rostral segment 0.14-0.15 mm long, 0.95-1.11 times as long as segment II of hind tarsus, and bearing 6-8 accessory hairs. Length of hind femora 0.79-1.04 mm, of hind tibiae 1.51-1.86 mm; 0.33-0.39 and 0.60-0.74 times as long as body length, respectively. Ratio hind tibiae / femora 1.73-1.91. Siphunculi 0.49-0.68 mm long, distal 0.09-0.15 mm reticulated (16-22% of the siphunculi length), 0.20-0.25 of the body length, 0.76-0.93 times as long as antennal segment III, 1.33-1.61 as long as cauda. Cauda 0.33-0.44 mm long. Other characters like the alate specimen.

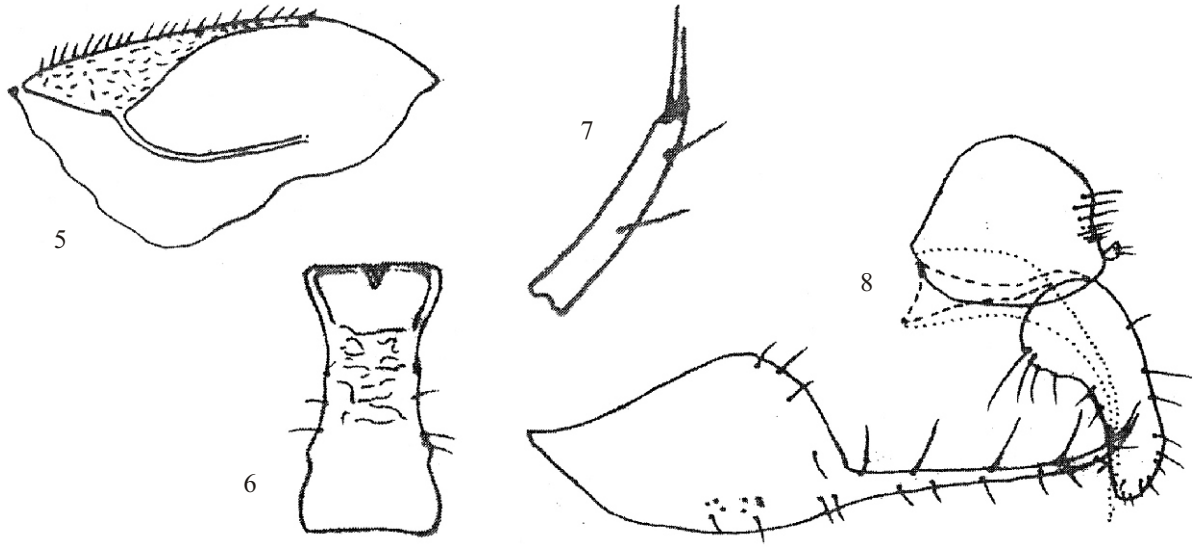
Material. Three alate viviparous females and 16 apterous viviparous females, 02-IV-2001; 10 alate viviparous females and eight apterous viviparous females, 14-IV-2001; four alate viviparous females and eight apterous viviparous females, 19-V-2001. Other data as in Material and Methods.

***Binodoxys achalensis* Starý, sp.n.**
(Figs. 5-8)

Diagnosis. The new species differs from *B. tucumanus* (Starý), the only known *Binodoxys* species in the area by the following morphological characters: petiole is distinctly widening from the spiracules tubercles to the secondary tubercles. Ovipositor sheaths are wider and bear smaller excissae in the basal third, the setae on the upper margin of the prongs of the last metasomal sternite are distinctly longer than these on the lower margin. The host range of the new species seems to be restricted to some *Uroleucon*-aphids, whereas the aphid *Myzus persicae* (Sulzer) is the only host species known to *B. tucumanus*.

Etymology. The name of the new species refers to known area of distribution.

Female. Head: Eyes oval, large. Antenna 12-segmented, filiform, not thickened to the apex, as long as the head, mesosoma and half of metasoma together. Flagellomere 1 (= F1) slender, almost four times as long as wide, without placodes. F2 three times as long as wide, with one placode. Medium flagellomeres 2.5 times as long as broad, only slightly wider than F1 or F2, preapical F as broad as the middle F. Maxillary palpi 4-, labial palpi 2-segmented.
Mesosoma: Mesonotum smooth, with sparse setae. Propodeum with broad pentagonal areola. Forewing (Fig. 5): stigma short, triangular, about three times as long as wide. Metacarp as long as to half of stigma length. Radial vein slightly longer than half of its possible length to the wing apex, and almost reaching the length of metacarp when paralelly compared from above. Legs: Hind femur with sparse semierect setae.
Metasoma: Petiole (Fig. 6) slender, long, slightly widening from spiracular (= primary) tubercles to the secondary tubercles. Spiracular tubercles distinctly smaller than the secondary tubercles, distance between spiracular and secondary tubercles



Figures 5-8. *Binodoxys achalensis* Starý, sp.n., female paratype. 5 - Forewing, detail, 6 - Petiole, 7 - Apex of the prong, detail, 8 - Genitalia.

distinctly shorter than the width across spiracular tubercles. Second third of the petiole with coarse transverse rugosities, with sparse setae on the sides. Metasomal tergite 2 smooth, with a simple row of short setae along the lower suture. Genitalia (Figs. 7, 8): Ovipositor sheaths strong, with several excissures in the inner basal third. Prongs long, narrow, slightly arcuate at the apex, with four equally long setae on the upper margin, the length of each seta is about three times as the width of the prong at its base; lower margin with several (6-7) setae which are distinctly shorter than these on the upper margin; with two long simple setae at the apex (Fig. 7).

Coloration: Head dark brown, mandibles brown, palpi light brown. Mesosoma uniformly dark brown. Wings hyaline, venation brownish. Legs yellow brown, hind coxae infuscated. Metasoma prevalently brown, petiole brown, apical third beyond secondary tubercles yellowish. Second tergite with triangular yellowish spot in the centre to prevalently yellowish. Ovipositor sheaths and prongs dark brown, apex of the last sternite before the prongs lighter. Body length about 2.3 mm.

Male. Antenna 13-segmented. Petiole similar as in the female. Coloration similar to the female, apex of metasoma entirely brown.

Material. Holotype♀: Quebrada del Condorito, 2000 meters alt.a.s.l., prov. Córdoba, Argentine, from *U. bereticum* on *C. bonariensis*, 24-III-2002, M. A. Delfino col. Paratypes: 2♀ and 1♂, from *U. bereticum* on *C. bonariensis*, 14-IV-2001, M. A. Delfino col. Holotype female is deposited in coll. P. Starý (Ceské Budějovice, Czech Republic), one paratype female mounted as slide and the paratype male in coll. P. Stary, a paratype female in the Museo de Ciencias Naturales de La Plata, Argentina.

Literature Cited

Blanchard, E.E. 1922. Aphid notes. Parts I-II. Argentine species of the subtribe Macrosiphina (Homoptera). Physis 5: 184-214.

Blanchard, E.E. 1932. Aphid miscellanea. Part I. Physis 11: 19-36.

Blanchard, E.E. 1939. Estudio sistemático de los Afidoideos argentinos. Physis 17: 857-1003.

Eastop, V.F. & D. Hille Ris Lambers. 1976. Survey of the world's aphids. The Hague, W. Junk, 573p.

Essig, E.O. 1953. Some new and noteworthy Aphididae from western and southern South America. Proc. Calif. Acad. Sci. 28: 59-164.

Essig, E.O. 1956. Some South America aphids from Paraguay (Homoptera: Aphididae). Pan-Pacific Entomol. 32: 186-187.

Holman, J. 1974. Two new *Uroleucon* species (Homoptera, Aphididae) from the USSR. Acta Entomol. Bohemoslov. 71: 19-26.

Holman, J. 1981a. One new and one little known Mediterranean *Uroleucon* species on *Inula* (Homoptera, Aphididae). Acta Entomol. Bohemoslov. 78: 43-52.

Holman, J. 1981b. A review of *Uroleucon* species (Homoptera, Aphididae) confined to Asteraceae: Inuleae. Acta Entomol. Bohemoslov. 78: 162-176.

Moran, N.A. 1984. The genus *Uroleucon* (Homoptera:Aphididade) in Michigan: Key, host records, biological notes, and descriptions of three new species. J. Kansas Entomol. Soc. 57: 596-616.

Remaudière, G. 1992. Une méthode simplifiée de montage

des aphides et autres petits insectes dans le baume du Canada. Revue. Fr. Entomol. (N.S.), 14: 185-186.

Remaudière, G. & M. Remaudière. 1997. Catalogue des Aphididae du monde. Paris, INRA, 473p.

Starý, P. & M. A. Delfino. 1986. Parasitoids (Hym., Aphidiidae) of aphids (Hom., Aphididae) in Tucumán, Argentina. Boll. Lab. Ent. Agr. Filippo Silvestri 43: 41-50.

Zonta de Carvalho, R.C., R.L. Blackman & J.M. Spence. 1998. The Genus *Uroleucon* Mordvilko (Insecta, Aphidoidea) in South America, with a key and descriptions of four new species. Zool. J. Linn. Soc. 123: 117-141.

Received 24/10/03. Accepted 01/06/04.