

A NEW SPECIES OF *APHIS* L. (HEMIPTERA: APHIDIDAE: APHIDINA)
LIVING ON URTICACEAE IN ARGENTINA

M. P. MIER DURANTE, J. ORTEGO, AND J. M. NIETO NAFRÍA

(MPMD, JMNN) Departamento de Biología Animal, Universidad de León, E-24071 León, Spain (e-mails: dbammd@unileon.es; dbajnn@unileon.es); (JO) INTA EEA Junín, Casilla de Correo 78, 5570 San Martín (Mendoza), Argentina (e-mail: jortego@junin.inta.gov.ar)

Abstract.—A new Argentinean aphid species, *Aphis mendocina*, is described. It lives on the native Urticaceae, *Urtica mollis*. Descriptions of apterous and alatae viviparous females, oviparous females, and males, which are apterous, are presented. An identification key to the apterous viviparous females of *Aphis* species with large dorsal abdominal sclerotization recorded from South American is given.

Resumen.—Se describe una nueva especie argentina, el pulgón *Aphis mendocina*, que vive sobre la urticácea nativa *Urtica mollis*. Se exponen los caracteres de las hembras vivíparas ápteras y aladas, de las hembras ovíparas y de los machos, que son ápteros. Se presenta una clave de identificación de hembras vivíparas ápteras de las especies de *Aphis* con extensa esclerotización dorso-abdominal citadas de Sudamérica.

Key Words: *Aphis mendocina*, *Aphis*, Aphididae, Aphidina, aphids, new species, Mendoza, Argentina, South America, identification key

The total number of aphid species recorded in Argentinean continental territory has risen from 133 to 200 between 1993 and 2003; moreover, the number of recorded South American native species from Argentina has also increased from 22.6% to 24.5%, including 22 new species described during this period (Nieto Nafría et al. 1994, Ortego et al. 2004), which belong to the subfamily Aphidinae, five of them to the tribe Macrosiphini and 17 to the tribe Aphidini and subtribe Aphidina, with 13 species included in the genus *Aphis* Linnaeus (Ortego et al. 2004).

Only two (*Aulacorthum solani* (Kaltenbach and *Myzus persicae* (Sulzer) (Macrosiphini)) of the 200 species have been recorded on Urticaceae, specifically on *Urtica urens* L.; another seven polyphagous species known from Argentina (*Aphis craccivora*

Koch, *A. fabae* Scopoli, *A. gossypii* Glover, *A. spiraecola* Patch (Aphidini), *Macrosiphum euphorbiae* (Thomas), *Myzus ascalonicus* Doncaster and *My. ornatus* Laing (Macrosiphini)) could live on several species of Urticaceae; it is also possible that *Microlophium carnosum* (Buckton) (Macrosiphini) can be found in the country as it has been recorded from Chile (Smith and Cermeli 1979, Nieto Nafría et al. 1994, Seco Fernández et al. 2000, Fuentes-Contreras et al. 1997).

Specimens were collected on *Urtica mollis* Steud. (Urticaceae) in Mendoza province (Argentina). When alive they were identified as belonging to a species in the genus *Aphis* with apterous females similar to those of the polyphagous and well-known *Aphis craccivora* Koch. These specimens are described below as a new species.

MATERIAL AND METHODS

The techniques for catching, conserving, slide mounting and measuring aphids are the habitual ones in aphidology (Nieto Nafría and Mier Durante 1998 provide a detailed exposure).

The aphid terminology used is in general also the habitual (Miyazaki 1987; Footitt and Richards 1993), but we use the term papilla (plural: papillae) for the membranous and more or less hemispheric tubercle. Several aphid species have aestivating form of apterous viviparous females, which differs from the "normal" form (from spring, early summer or autumn); it is named: (a) "summer dwarf" ("dwarf") if it is very small and diverse to "normal", or (b) "small summer" ("small") if it is smaller than "normal" but not very different in characters to it (Miyazaki 1987). We use the term "small" for the aestivating form of apterous viviparous females of the new species caught from January and February (the austral summer), which are at most 1.50 mm long and have an incomplete and brown discal thoracic-abdominal plate, and the term "big" for the apterous viviparous females from February to April, which are at least 1.50 mm long (exceptionally 1.40) and have a big and black discal thoracic-abdominal plate.

Abbreviations used in the text and figure captions are as follow: AbdI, AbdII, AbdIII, AbdIV, AbdV, AbdVI, AbdVII, AbdVIII are each abdominal segment I to VIII; AntI, AntII, AntIII, AntIV, AntV, AntVIb, AntVIpt are antennal segments I to V plus base and processus terminalis of antennal segment VI, respectively; Ars is apical rostral segment; D is basal diameter of antennal segment III; and Ht2 is second segment of hind tarsus. Values in parenthesis are exceptional values.

***Aphis mendocina* Mier Durante, Ortego, and Nieto Nafría, new species**
(Figs. 1–5)

Apterous viviparous female (n = 590; 34 measured) (Figs. 1, 2).—Body 1.07 to 2.13

mm. long, 6.1 to 10.8 times siphunculus. Field features: shiny black (big specimens) or dark green or dark brown (small specimens), with part of antenna and tibia yellowish and without waxy powder. Slide-mounted specimens: big specimens with dark brown dorsum (prothoracic arc, a complete discal plate from mesothorax to abdominal segment VI, a ring around the base of siphunculus excepted, and a bar on both abdominal segments VII and VIII), siphunculi black, clypeus, distal part of rostrum and cauda brown and antennae and legs yellowish; small specimens with brown head, siphunculi and cauda, light brown to yellowish dorsum (a broad thoracic-abdominal patch and bars on prothorax and abdominal segments VII and VIII at most, to at least several disperse sclerites on thorax and abdominal segments I to VI) and zones of antenna and legs pigmented as dorsal sclerites.

Thoracic and abdominal dorsal cuticle delicately or inappreciably reticulated. Marginal papillae on prothorax ogival and smaller than triommatidium; abdominal I and VII papillae similar in shape but larger than prothoracic ones; other abdominal papillae absent.

Front margin straight or moderately sinuate. Dorsum of head and AntI smoky to dark brown. Setae on vertex fine, acute, 25–45 μm long and 1.2–2.3 times D. Antenna 6 segmented, 0.50–1.13 mm long, 0.36–0.67 times body length and without secondary sensoria. AntIII as pale as AntII, slightly imbricate on ventral side, 0.11–0.35 mm long (1.0–2.0 times AntVIpt) and with 3–10 (rarely less than 5) setae, which are (13)18–28 μm long and 0.9–1.4 times D. Other segments of antennal flagellum well imbricated; AntIV as pale as AntIII and 0.08–0.24 mm long; AntV progressively pigmented and (0.05)0.08–0.21 mm; AntVIpt smoky pigmented, 0.11–0.19 mm and 1.3–1.7 (rarely more than 1.6) times AntVIb, which is 0.07–0.13 mm long and also smoky. Rostrum (0.36)0.42–0.56 mm long, reaching hind coxae and (0.23)0.25–

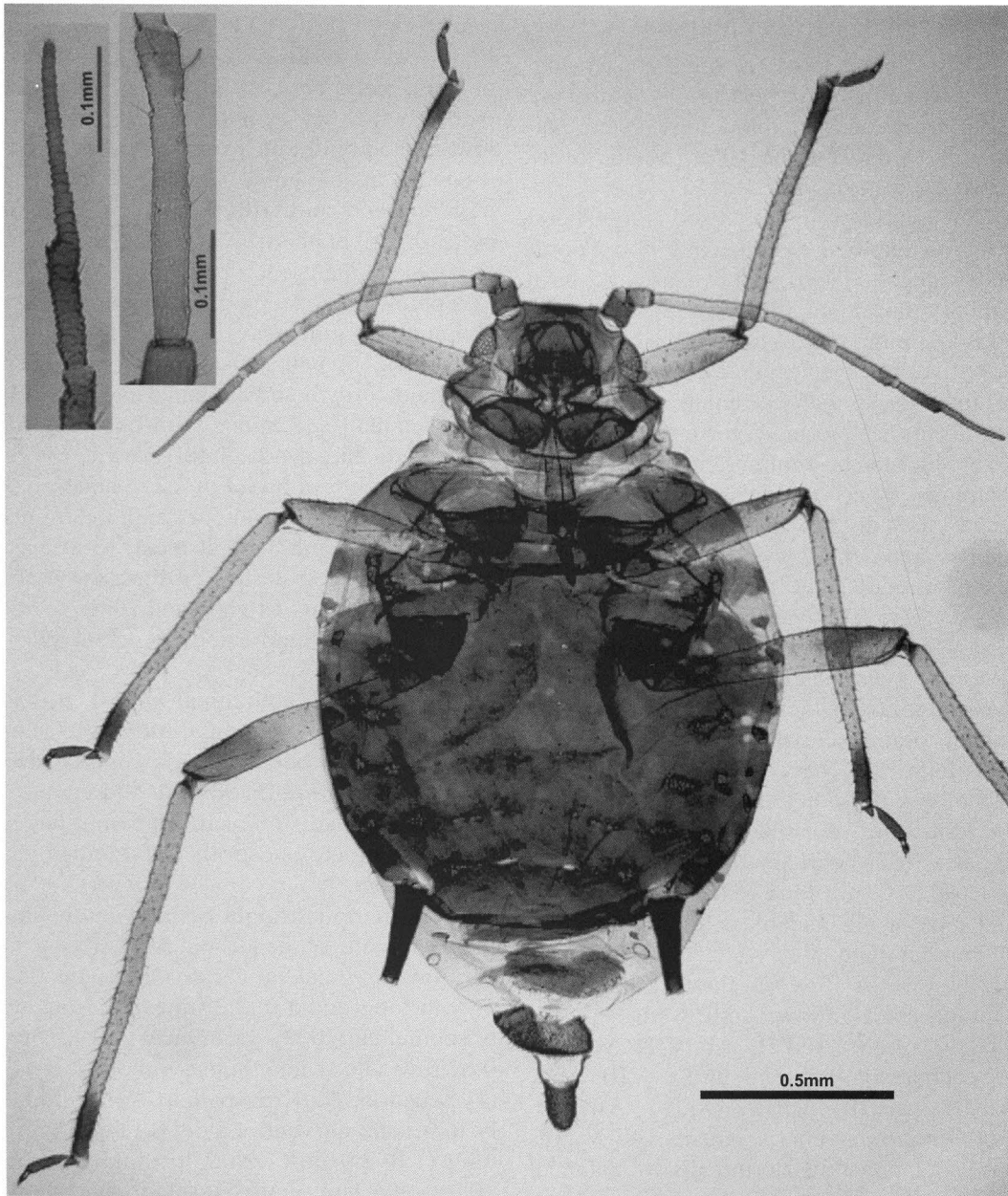


Fig. 1. *Aphis mendocina*, apterous viviparous female "big". AntIII and AntVI are detailed.

0.36 times body length. Ars dark brown, 0.10–0.15 mm, 1.1–1.3 times Ht2, 1.2–1.6 times AntVIb, and narrow (2.3–3.1 times its basal width) and with slightly concave sides; it has 2 secondary setae.

Coxae, trochanters, part of femora (up to the distal half on several small specimens,

or to dorsal apical patch on several big specimens), apical zone of tibiae and tarsi dusky to brown. Inside seta of hind trochanter (33)40–55 μm , 0.8–1.4 times diameter of trochanter-femoral joint. Longest dorsal setae on hind femur (15)25–45(50) μm and (1.2)1.5–2.9 times D. Outside setae

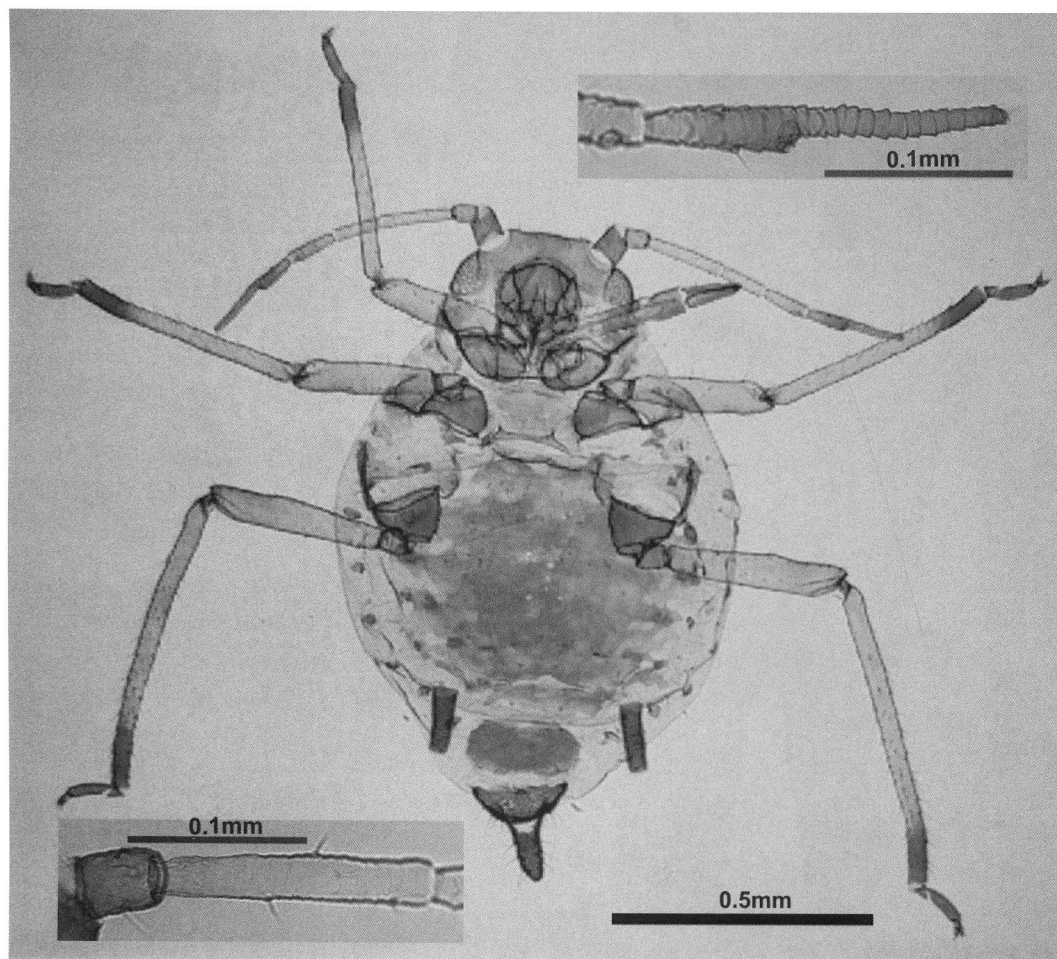


Fig. 2. *Aphis mendocina*, apterous viviparous female "small". AntIII and AntVI are detailed.

on middle length of hind tibia 25–50 μm long and 0.7–1.3 the diameter of the article at its insertion point. First tarsal segment with 3.3.2(3) setae. Ht2 0.09–0.12 mm long.

Dorsal setae on AbdII to AbdIV fine and blunt, (23)30 to 45 μm long (1.2–2.3 times D). AbdVIII with 2–4 (very exceptionally 5) dorsal setae, which are fine, acute (as AbdVII ones), (33)40–60(65) μm and (1.4)2.2–3.3 times D.

Siphunculus more or less cylindrical, slightly tapering to apex, rough, (0.10)0.13–0.30 mm, 2.7–5.4 times its width at middle and 0.8–1.4 times cauda. Genital plate with 2–8 discal and 6–16 pos-

terior setae. Cauda broad fingerlike, (0.13)0.15–0.24 mm and 1.2–1.7(2.1) times its basal width, with 5–13 setae (more frequently 8–11).

Alate viviparous female ($n = 13$; 8 measured) (Fig. 3).—Body 1.55–1.85 mm long. Field features: matt black with dusky antenna and brown legs. Slide-mounted specimens: antenna and legs more intensely and extensively pigmented than apterae. AbdII–AbdVI (very infrequently on AbdI) with marginal sclerites, AbdV–AbdVII (infrequently also on AbdI–AbdIV) with spinal sclerites or bar (sometimes broken) and AbdVIII with a bar. Antenna 1.05–1.12 mm long and 0.59–0.68 times body length;

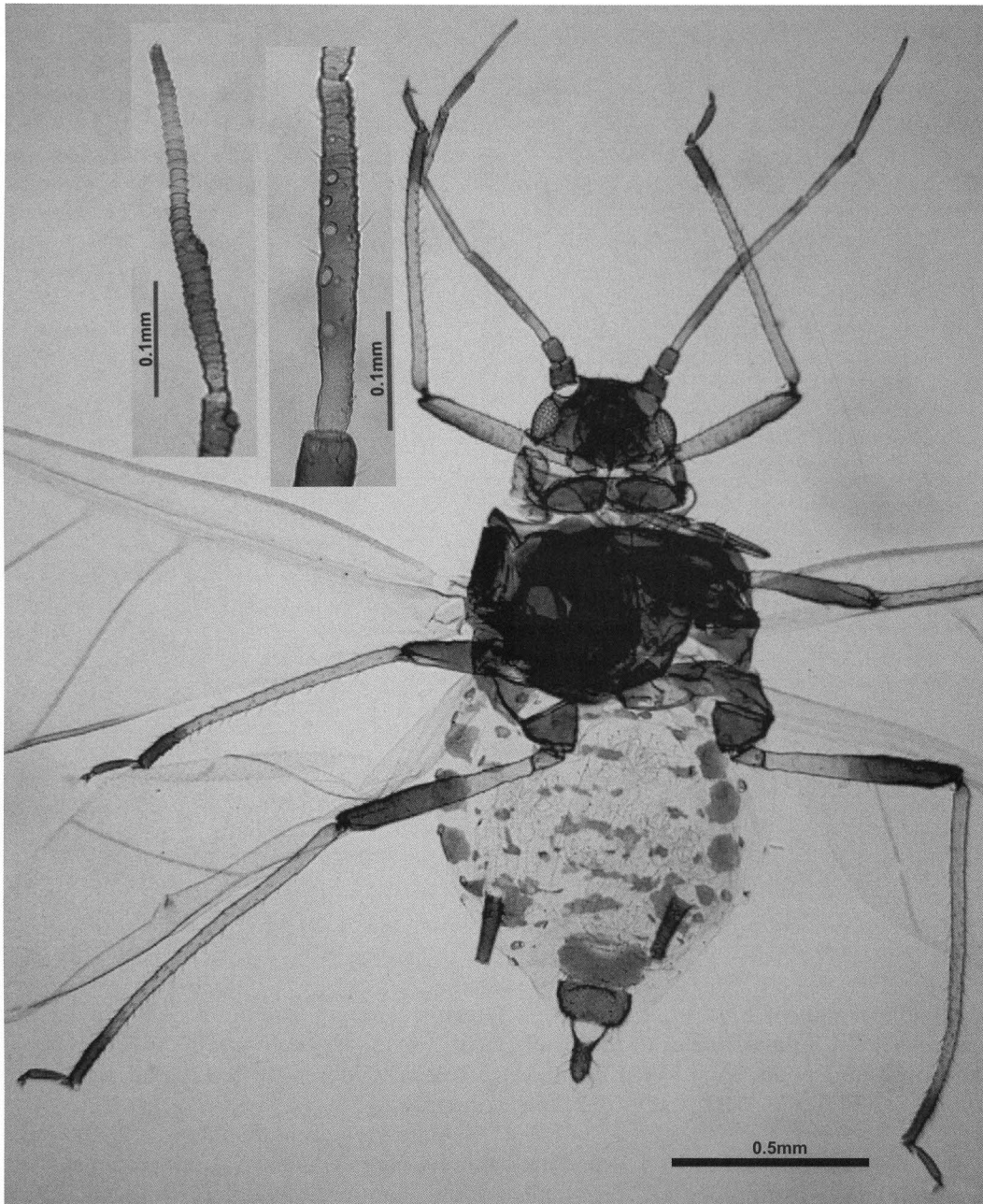


Fig. 3. *Aphis mendocina*, alatae viviparous female. AntIII and AntVI are detailed.

AntIII 0.27–0.30 mm, 1.6–2.0 times AntVIpt and with (2)5–8 secondary sensoria; AntIV 0.19–0.20 mm and exceptionally with 1 secondary sensorium; AntV 0.16–0.19 mm; AntVIb 0.11–0.14 mm; AntVIpt 0.14–0.18 mm and 1.1–1.6 times AntVIb.

Other characters as those of apterous viviparae.

Oviparous female ($n = 98$; 20 measured) (Fig. 4).—Body 1.47–1.83 mm long, 10.7–16.4 times siphunculus. Field features: shiny black, with part of antenna and tibiae

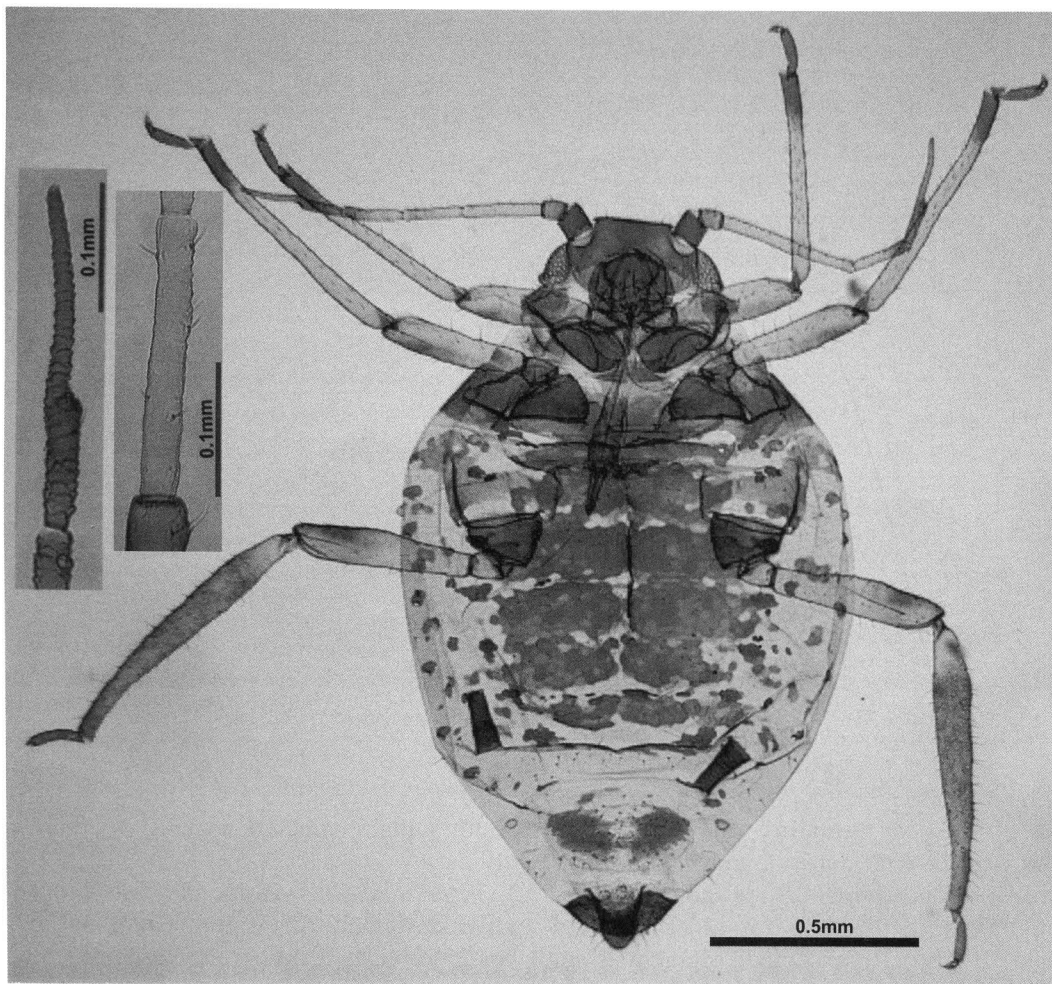


Fig. 4. *Aphis mendocina*, oviparous female. AntIII and AntVI are detailed.

yellowish and without cereous powder. Slide-mounted specimens: head, AntI, AntVI, clypeus, distal part of rostrum, dorsum of thorax, coxae, distal part of femora, apical $\frac{1}{4}$ of tibia of anterior and intermediate legs, hind tibia, tarsi, abdominal sclerites, siphunculus, cauda, anal plate, and the periphery of genital plate dark brown to black; and AntII, distal part of AntV, and trochanters dusky to brown. AbdI-AbdV normally with spinal-marginal bar partially coalesced between them, AbdVI with spinal sclerites, and AbdVII and AbdVIII with a more or less tenuous bar. Ars 0.11–0.13 mm, 1.0–1.4 Ht2, 0.8 to 1.2 times AntVIb.

Hind tibia uniformly swollen, outside hairs at middle are 30–43 μm and 0.5–0.7 times diameter of article at its insertion point and with (40)80–150 scent plates (one specimen with only 21 and 25 on each leg). Siphunculus 0.09–0.17 mm long, 2.0–3.3 times its width at middle and 0.6–1.1 times cauda. Postsiphuncular part of abdomen extended. AbdVIII with 9 to 13(16) dorsal setae. Genital plate with 46–67 setae. Cauda more or less broadly triangular in shape, 0.14–0.17 mm long, 0.9–1.4 times its basal width, and with (8)10–14 setae. Other characters as those of apterous viviparae.

Apterous male (n = 112; 15 measured)

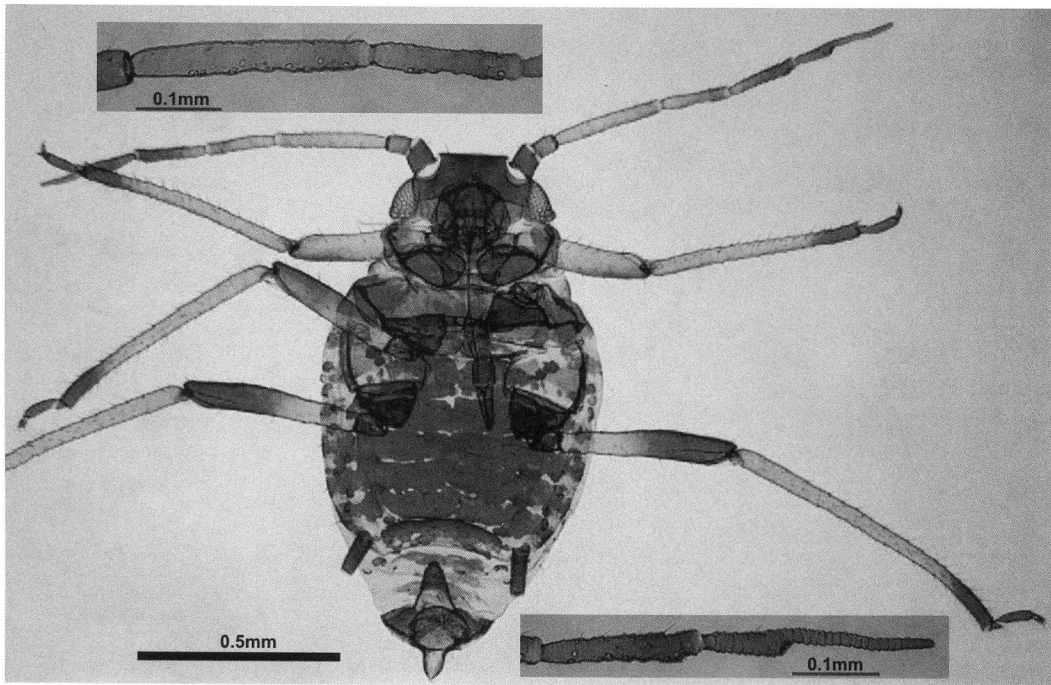


Fig. 5. *Aphis mendocina*, male (apterous). AntIII and AntVI are detailed.

(Fig. 5).—Body 1.12–1.30 mm. long, 10.3–14.4 times siphunculus. Field features: shiny black with antenna and most of legs brown to dark brown. Slide-mounted specimens: dark brown dorsum, most of AbdVII–AbdVIII excepted; pigmented antenna (specially segments I, V and VI) and legs, (but most part of tibiae and basal part of femora yellowish), brown cauda, anal plate, and parameres, and black siphunculus. Dorsal sclerotization very broad: arc on prothorax, complete or spinal-pleural bar and marginal patches on mesothorax and AbdI to AbdVI, and bar on both abdominal segments VII and VIII. Antenna 6 segmented, 0.87–1.18 mm and 0.71–0.90 times body length. AntIII with (11)13–17 (one specimen with 0 and 2 on each antenna), both AntIV and AntV with (1)6–13 and AntVIb habitually without (one specimen with 1 and another with 8, only on one antenna) secondary sensoria. Siphunculus smaller than those of apterous females: 0.08–0.13 mm, 1.9–3.1 times its width at middle and 0.7–1.0 times cauda. Cauda

0.11–0.13 mm and 0.9–1.3 times its basal width. Other characters as those of apterous viviparae.

Type material.—Holotype: apterous viviparous female (measured specimen number 29) collected on *Urtica mollis* Steud. at Malargüe: Refugio del Club Andino (Mendoza province, Argentina, 35°24'S, 69°54'W, 2,183 m), 23-IV-1996, Ortego leg., in collection of the Universidad de León (Departamento de Biología Animal). Paratypes: 589 apterous and 13 alate viviparous females, 98 oviparous females and 112 males found with the holotype and on the same host plant at: Malargüe: Refugio del Club Andino, 13-III-2003 (J. Ortego leg.), Malargüe: El Chihuido (35°42'S, 69°38'W, 1,900 m), 9-III-1997 (J. Ortego leg.), Malargüe: Los Molles (35°10'S, 69°57'W, 1,830 m), 5-II-2000 (Mier Durante, Nieto Nafría & Ortego leg.) and San Rafael: El Sosneado (Mendoza province, 35°45'S, 69°50'W, 2,000 m), 7-I-1994 (J. Ortego leg.), deposited in the collections of the Universidad de León (León, Spain),

INTA EEA Junín (Junín, Argentina), The Natural History Museum (London, United Kingdom), Muséum Nationale d'Histoire Naturelle (Paris, France), and the National Museum of Natural History, Smithsonian Institution aphid collection (Beltsville, MD, USA).

Etymology.—The specific name is an adjective, named for the inhabitants of Mendoza province; it is in the feminine gender as *Aphis*.

Biology and distribution.—*Aphis mendocina* is monoecious and holocyclic on *Urtica mollis* (see discussion). Dense colonies are formed on the stems and leaf petioles, and large populations extend to the leaf limbs.

The number of alatae and alate nymphs collected is very small, but we cannot be sure that such a low production of alatae (general or coinciding with this moment in time) is a usual characteristic of the species.

Currently, it is only known from Mendoza province, but it is possibly distributed in areas in South America where *U. mollis* lives, e.g., Andean provinces of Argentina from Jujuy to Santa Cruz, a part of Chile and Peru (Missouri Botanical Garden 1999).

Discussion.—*Aphis mendocina* belongs to the nominotypical subgenus according to Eastop (1979a) and to the South American group of species according to Hille Ris Lambers (1974) and Remaudière (1994).

The taxonomic identity of the host plant is much-discussed (Missouri Botanical Garden 1999, Zuloaga and Morrone, 1999), for some authors it is a good species, whereas for others it is a variety from the Euroasiatic *Urtica dioica*. However, the authors (Argentinean) of the latter opinion have no hesitation in claiming that it is a variety from Argentina! The presence of a monoecious aphid (with apterous males!) could be another reason for considering them as different species as the specificity and taxonomical accuracy of the aphids is well-known (Eastop 1979b, 1998). If the hypothesis that the host plant is *Urtica dioica* were true and as *Aphis mendocina* belongs to the South

American species group in the genus *Aphis*, due to its characters, we would have to consider that it must live on an autochthonous species belonging to the genus *Urtica* or at least to the family Urticaceae. The search for this hypothetical plant has given no results, but the territory to be prospected is enormous!

Apterous viviparous females of *Aphis mendocina* usually have discal or spinal-pleural plate, sometimes with holes or broken, on thorax and abdomen or only on abdomen. A large dorsal sclerotization (from large segmental bands to discal plate) is also present in another fifteen species of genus *Aphis* recorded from South America (Hille Ris Lambers 1974; Mier Durante and Ortego 1999, Mier Durante et al. 2003; Nieto Nafría and Ortego 2002; Nieto Nafría et al. 1999; Ortego, 1998; Ortego and Mier Durante 1997; Remaudière 1994): *A. alstromeriae* Essig (Chile), *A. berberidorum* Ortego & Mier Durante (Argentina and Chile), *A. cinerea* Nieto Nafría & Ortego (Argentina), *A. craccivora* (introduced species; several South American countries), *A. cytisorum* Hartig (introduced species; Argentina, Peru), *A. danielae* Remaudière (Argentina), *A. intrusa* Ortego (Argentina), *A. malalhuina* Mier Durante, Nieto Nafría and Ortego (Argentina), *A. marthae* Essig (Chile), *A. melosae* Mier Durante and Ortego (Argentina), *A. mulini* Hille Ris Lambers (Argentina), *A. mulinicola* Hille Ris Lambers (Argentina), *A. papillosa* Mier Durante, Nieto Nafría and Ortego (Argentina, Chile), *A. roberti* Nieto Nafría, Ortego and Mier Durante (Argentina, Chile), and *A. senecionicoides* Blanchard (Argentina).

These species can be identified using the following key. Data from above mentioned authors and García Prieto and Nieto Nafría (in press), plus our new observations. Note that poorly-sclerotized or unsclerotized specimens are present in several species. Host plant and color when alive are given in square brackets.

KEY TO SPECIES

Apterous viviparous females with large dorsal sclerotization of the species of *Aphis* recorded from South America

1. AbdII-AbdIV usually without marginal papillae, sometimes with 1 to 3 in all; if exceptionally there are 4 to 6, siphunculus shorter than 0.5 times cauda, or if longer (0.7–1.2 times): Ars 0.09–0.13 mm and 1.0–1.3 times Ht2, and short setae (on AntIII, AbdII-AbdIV and AbdVIII respectively 10–14, 13–28 and 20–38 μ m) 2
 - AbdII-AbdIV usually with at least 4 marginal papillae in all; if 1–3, exceptional “big” specimens living on *Grindelia chiloensis* 13
2. Sclerotization dorsal on thorax and abdomen evidently segmental, with spinal-pleural bands, sometimes partially coalescent between and/or to marginal small patches 3
 - Abdominal or thoracic-abdominal spinal-pleural to discal plate present, sometimes with intersegmental and/or spinal holes 4
3. Ars 0.8–1.0 times Ht2. Cauda 0.21–0.31 mm. Setae on AbdVIII 22–33 μ m. Genital plate with 6–11 posterior setae. [On *Lathyrus macroopus*. White cereous powdered] . . . *A. cinerea*
 - Ars 1.0–1.1 times Ht2. Cauda 0.17–0.20 mm. Setae on AbdVIII 30–47 μ m. Genital plate with 12–15 posterior setae. [On *Alstroemeria*. Possibly black] *A. alstroemeriae*
4. Secondary sensoria present on AntIII. [On *Senecio subumbellatus*. Shiny black] . . . *A. intrusa*
 - Secondary sensoria absent on AntIII 5
5. Siphunculus shorter than 0.5 times cauda. [On *Senecio subumbellatus*. Shiny dark brown to black] *A. malalhuina*
 - Siphunculus longer than 0.7 times cauda 6
6. AbdI-AbdVI with more than habitual 3 pairs of setae (2 marginal and 1 spinal). AbdVIII with 2(4) long (45–70 μ m) setae, which have strong base and very fine apex. [On *Quilajia saponaria*. Shiny black] *A. marthae*
 - AbdI-AbdVI with only habitual 3 pairs of setae (2 marginal and 1 spinal). AbdVIII setae if long in another shape 7
7. Distal part of hind femur always paler than apical part of tibia and usually as pale as distal part of other femora. AbdVIII with 3–5 setae. Ars 0.12–0.15 mm and 0.8–1.1 times Ht2. [On *Lycium* sp. Shiny black, sometimes poorly white cereous powdered] . . . *A. danielae*
 - Distal part of hind femur variably pigmented; but if it is pale and AbdVIII with 3–5 setae, Ars 0.09–0.12 mm and 1.1–1.3 times Ht2 8
8. Ars at most 1.0 times Ht2. Usually incomplete discal plate from metathorax to AbdVI (frequently broken spinal-pleural plate and AbdII-AbdIV marginal patches). AntVI 1.4–2.0 times AntVib (Ortego and Mier Durante 1997 wrote 1.71–2.32, but it was a mistake). Siphunculus 0.15–0.31 mm, 2.7–5.3 times its width at middle and 0.8–1.4 times cauda. [On several species of *Berberis*. Shiny brown] *A. berberidorum*
 - Ars 0.9–1.4 times Ht2; if shorter than 1.1, with other dorsal sclerotization, or other ratio AntVIpt/AntVib, or other siphunculus lengths (absolute or relative) 9
9. AntVIpt (1.3)1.6–3.5 times AntVib; if shorter than 1.6 times, discal plate complete, siphunculus 0.22–0.46 mm, 1.2–2.0 times cauda and setae on AbdVIII 10–23 μ m 10
 - AntVIpt 1.1–2.2 times AntVib; but if longer than 1.6 times, “dwarf” specimens living on *Grindelia chiloensis* with broken or incomplete discal plate, siphunculus 1.0–1.4 times cauda and Ars 1.2–1.4 times Ht2 and setae on AbdVIII 25–38 μ m 11
10. Shiny black without white cereous powder when alive. Ars 0.10–0.13 mm. [On many species of many families, mainly Fabaceae] *A. craccivora*
 - White cereous powdered when alive, more or less shiny black in alcohol. Ars 0.11–0.16 mm (frequently up from 0.13 mm). [On arboreal or shrubby Fabaceae species] *A. cytisorum*
11. Femora mostly dark pigmented, with a pale basal portion. AntII as dark as AntI, and both are darker than AntIII. Setae on AbdII-AbdIV and AbdVIII 13–28 and 20–38 μ m. [On *Mulinum spinosum*. Shiny black] *A. roberti*
 - Femora (specially front and middle) mostly pale, sometimes dusky to brown on a distal portion. AntII paler than AntI and nearly as pale as AntIII. Setae on AbdII-AbdIV and AbdVIII 22–45 and 30–65 μ m 12
12. AntVIpt 1.3–1.7 times AntVib. Cauda 0.13–0.24 mm and 1.2–2.1 times its basal width. [On *Urtica mollis*. Shiny black if “big” specimens, or dark green to dark brown if “small” specimens] *A. mendocina*
 - AntVIpt 1.7–2.4 times AntVib (exceptionally down to 1.4 in several “dwarf” specimens). Cauda 0.08–0.14 mm and 0.9–1.3 times its basal width 14
13. Marginal papillae large, except those on posterior abdominal segments; prothoracic papillae bigger than triommatidium. [On several species of *Senecio*. Opaque or shiny dark-brown to black] *A. papillosa*
 - Marginal papillae thin, all of them similar in shape and volume or posterior ones are thinner; prothoracic papillae thinner than triommatidium 14
14. AntVIpt 1.7–2.4 times AntVib (exceptionally

- down to 1.4 in several "dwarf" specimens). Setae on AntIII 10–25 μm . Secondary sensoria on AntIII mostly present in "big" specimens. [On *Grindelia chilensis*. Shiny dark-brown to blackish-brown if "big" specimens, or opaque light-brown to dark-green if "dwarf" specimens] *A. melosae*
- AntVIpt 0.9–1.7 times AntVib. Setae on AntIII variable in length, longer than 35 μm or shorter than 10 μm . Secondary sensoria always absent 15
15. Setae on AntIII, AbdII-AbdIV and AbdVIII 7–8, 12–32, 22–45 μm . Siphunculus 0.4–0.9 times cauda. [On several species of *Senecio*. Opaque to shiny black] *A. senecionicoidea*
- Setae on AntIII, AbdII-AbdIV and AbdVIII longer than 35, 39 and 60 μm . Siphunculus at least 0.8 times cauda 16
16. AntVIpt approximately 1.5 times AntVib. Siphunculus at least 1.3 times cauda. Cauda with 10–14 setae. [On *Mulinum spinosum*. Probably shiny dark brown to black] *A. mulini*
- AntVIpt approximately 1.0 times AntVib. Siphunculus at most 0.9 times cauda. Cauda with 8–10 setae. [On *Mulinum spinosum*. Probably shiny dark brown to black] *A. mulinicola*

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