

Two South American New Species of Neophyllaphis Subgenus Chileaphis (Hemiptera: Aphididae)

Authors: Mier Durante, M. Pilar, Nieto Nafría, Juan M., Delfino, Miguel-Ángel, Ortego, Jaime, and Quednau, F. Wolfgang

Source: Florida Entomologist, 91(3) : 359-366

Published By: Florida Entomological Society

URL: [https://doi.org/10.1653/0015-4040\(2008\)91\[359:TSANSO\]2.0.CO;2](https://doi.org/10.1653/0015-4040(2008)91[359:TSANSO]2.0.CO;2)

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

TWO SOUTH AMERICAN NEW SPECIES OF *NEOPHYLLAPHIS* SUBGENUS *CHILEAPHIS* (HEMIPTERA: APHIDIDAE)

M. PILAR MIER DURANTE¹, JUAN M. NIETO NAFRÍA¹, MIGUEL-ÁNGEL DELFINO²,
JAIME ORTEGO³ AND F. WOLFGANG QUEDNAU⁴

¹Departamento de Biodiversidad y Gestión Ambiental, Universidad de León, 24071 León, Spain
mpmied@unileon.es; jmnien@unileon.es

²Cátedra de Entomología, Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba,
Vélez Sarsfield, 299, 5000 Córdoba, Córdoba, Argentina
miguelangeldelfino@gmail.com

³INTA EEA Junín, Casilla de Correo 78, 5570 San Martín, Mendoza, Argentina
jortego@junin.inta.gov.ar

⁴Laurentian Forestry Centre; Forestry Canada, 1055, rue du PEPS,
P.O. Box 10380, Sainte-Foy, Québec, G1V 4C7 Canada
fquednau@nrcan.gc.ca

ABSTRACT

Two South American new species of *Neophyllaphis* Takahashi (Aphididae Neuquenaphidinae) are described, *Neophyllaphis cuschensis* Nieto Nafría & Delfino **sp. nov.** collected on *Podocarpus glomeratus* D. Don in Cusco (Peru) and *Neophyllaphis iuiuyensis* Mier Durante & Ortego **sp. nov.** collected on *Podocarpus parlatorei* Pilg. in San Salvador de Jujuy (Argentina). The apterous and alate viviparous females of *N. cuschensis* and the apterous and alate viviparous females, as well as the oviparous females and males of *N. iuiuyensis* are described. The differences between the nominotypical subgenus and *Chileaphis* and also the differences among the 4 species of subgenus *Chileaphis*, viz. the 2 new species and those already known and found in Chile, *N. michelbacheri* Essig and *N. podocarpini* Carrillo are outlined.

Key Words: aphids, Neophyllaphidinae, Argentina, Peru, *Podocarpus*

RESUMEN

Se describen dos nuevas especies del género *Neophyllaphis* Takahashi (Aphididae, Neophyllaphidinae) propias de la fauna de América del Sur, *Neophyllaphis cuschensis* Nieto Nafría & Delfino **sp. nov.** recogida sobre *Podocarpus glomeratus* D. Don en Cusco (Perú) y *Neophyllaphis iuiuyensis* Mier Durante & Ortego **sp. nov.** recogida sobre *Podocarpus parlatorei* Pilg. en San Salvador de Jujuy (Argentina). Se describen las hembras vivíparas ápteras y aladas de *N. cuschensis*, las hembras vivíparas ápteras y aladas y además las hembras ovíparas y los machos de *N. iuiuyensis*. Se exponen las diferencias entre el subgénero nominotípico y *Chileaphis* Essig y también las diferencias entre las cuatro especies del subgénero *Chileaphis*, las dos nuevas así como las ya conocidas y propias de Chile, *N. michelbacheri* Essig y *N. podocarpini* Carrillo.

Translation provided by the authors.

Neophyllaphidinae Takahashi, 1921, is one of the small subfamilies of the family Aphididae Latreille 1802 (Remaudière & Remaudière 1997) and occupies a basal position in the phylogenetic tree of the “drepanosiphids” or “drepanosiphines” group (Quednau & Remaudière 1994). This group is ranked by some authors as family or subfamily, in this last case Neophyllaphidinae is relegated to a lower rank. It includes 1 genus, *Neophyllaphis* Takahashi, 1920, currently formed by 13 species specialized in living on Podocarpaceae or Arau-

cariaceae. *N. araucariae* Takahashi, 1937, feeds on several species of *Araucaria* and possibly native to Australia; the others live on species of *Podocarpus* L’Her. ex Pers., 1807, though *N. michelbacheri* (Essig, 1953) was described on *Pilgerodendron uviferum* (D. Don) Florin, 1930 (Cupressaceae) and *N. brimblecombei* Carver, 1971, has been recorded on *Eucalyptus robusta* Sm., 1795 (Myrtaceae) in China (Essig 1953; Remaudière & Remaudière 1997; Blackman & Eastop 1994; Quiao et al. 2001).

Some authors (Russell 1966, 1982; Blackman & Eastop 1994) consider the genus to be homogeneous and have not divided it into subgenera. Others (Hille Ris Lambers 1967; Carrillo 1980; Remaudière & Remaudière 1997; Quiao et al. 2001) divided it into 2 subgenera, the nominotypical one and *Chileaphis* Essig, 1953, with 11 and 2 species, respectively. We agree with the second treatment because the 2 known species of *Chileaphis*: *N. michelbacheri* and *N. podocarpini* Carrillo, 1980, and the 2 described below differ from the 11 species in the nominotypical subgenus because: (1) eyes are multifaceted in all forms, apterous viviparous females included; (2) membranous distal part of the caudal knob is differentiated from the sclerotized proximal part in the apterous viviparous females; (3) basal width of the cauda is similar to the maximum width of the caudal knob in the apterous viviparous females; and (4) the first abdominal segment has a marginal process (or small tuberculiform sclerite) in the alate viviparous females (and other alate forms).

The division into 2 subgenera coincides well with the geographical distribution of the species, without considering the introduction of *N. araucariae* into the United States, Mexico and Costa Rica, or *N. podocarpini* Takahashi, 1920, into North America and Italy. The 2 known species of *Chileaphis* and those described below are found in South America, while 2 of the species in subgenus *Neophyllaphis* inhabit Africa and the other 9 species are in different parts of the Asiatic-Australian arch of the Pacific or neighboring areas (Limonta 1990; Blackman & Eastop 1994; Qiao et al. 2001).

Neophyllaphis michelbacheri was recorded on *Pilgerodendron uviferum* and *Podocarpus nubigenus* Lindl., 1807; the latter may well be the habitual host of the species, whereas the former may be a stray record. In fact, Essig (1953) states "This interesting new genus and species was collected by Dr. A. E. Michelbacher by beating the available limbs and foliage of the Chilean cypress, *Pilgerodendron uviferum*". The leaves of both plants are relatively similar and, above all, they share the same habitat. *Podocarpus nubigenus* is included in the section *Australis* de Laub, 1985, in the genus *Podocarpus* Labill., 1806, and is distributed throughout regions IX, X, XI, and XII in Chile and the Argentinean provinces of Neuquén, Río Negro, and Chubut, this being the largest foreseeable distribution area of the aphid-species. The distribution area of *Pilgerodendron uviferum* partly overlaps the fore-mentioned one, but is more southern, and includes regions X, XI, and XII in Chile and some areas of Neuquén, Río Negro, Chubut, Santa Cruz, and Tierra del Fuego in Argentina (Missouri Botanical Garden 1999; Instituto de Botánica Darwinion 2007; Stark Schilling & Le-Quesne Geir 2007).

Neophyllaphis podocarpini lives on *Podocarpus salignus* D. Don, 1824. This plant-species is

included in the section *Capitularis* de Laub, 1985, and has a more northern distribution area than the other plants, in regions VII, VIII, IX, and X in Chile, and has not been reported in Argentina (Missouri Botanical Garden 1999; Instituto de Botánica Darwinion 2007; Stark Schilling & Le-Quesne Geir 2007). This could also be the maximum distribution area of the species.

During 2 visits in Cusco some of the authors (D., M. D., and N. N.) had the opportunity to collect *Neophyllaphis* on young cultivated specimens of *Podocarpus glomeratus* D. Don, 1824. This plant-species is included in the section *Capitularis* and is found in Peru (Cusco area included), Bolivia, and Ecuador (Missouri Botanical Garden 1999). Some colleagues later contributed more specimens collected on the same plant.

Encouraged by the discovery of what could be the third species in subgenus *Chileaphis* during an expedition in northwest Argentina by some of the authors (M. D., O., and N. N.) in Nov 2006, a visit to localities where *Podocarpus parlatorei* Pilg., 1903, grows was planned. We collected aphids on this plant in San Salvador de Jujuy. The plant-species is also included in the section *Capitularis* and is found in south Bolivia as well as the provinces of Jujuy, Salta, Catamarca, and Tucumán in northwestern Argentina (Missouri Botanical Garden 1999; Instituto de Botánica Darwinion 2007).

MATERIALS AND METHODS

The aphids were measured by the method normally used in our studies (Nieto Nafria & Mier Durante 1998), only differing from Blackman & Eastop (1994) in how the body length is measured: viz. from the front to the tip of the cauda or the posterior edge of the anal plate, respectively.

Abbreviations used in the text, tables, and figure captions are as follows: AntI, AntII, AntIII, AntIV, AntV, AntVIb, AntVIpt are antennal segments I to V plus base and processus terminalis of antennal segment VI, respectively; *D* is the basal diameter of AntIII; AbdI to AbdVIII are abdominal segments I to VIII. Values in parenthesis are exceptional values.

RESULTS AND DISCUSSION

Based on information obtained from Blackman & Eastop (1994), Essig (1953), Carrillo (1980), Hille Ris Lambers (1970), and Russell (1982), and from data obtained in a study of several samples of *N. (C.) michelbacheri* and *N. (C.) podocarpini*, we can state that the specimens from Cusco and San Salvador de Jujuy belong to 2 new species to be included in the subgenus *Chileaphis*: *Neophyllaphis (Chileaphis) cuschensis* and *Neophyllaphis (Chileaphis) iuiuyensis*, described below. The specific names are adjective in the feminine gender because *Neophyllaphis* is feminine, as is *Aphis*,

referred to inhabitants of Cusco and Jujuy, latinized as usual in the respective catholic dioceses.

These 2 species and *N. podocarpini* differ from *N. (C.) michelbacheri* because in the apterous viviparous females (alate forms are not known in this species): (1) antennae are at least 0.5 times body length; (2) maximum width of head, including eyes, at most is 1.7 times AntIII; and (3) setae on dorsum of abdomen (or at least most of them) at least 10 μ m. Their host-species belong to different sections of the genus *Podocarpus*.

Neophyllaphis (C.) iuiuyensis differs from *N. podocarpini* and from *N. (C.) cuschensis* because (1) membranous distal part of the caudal knob in apterous viviparous females is small, contrasting very little with the rest of the knob; (2) the dorsum of head, antennae, legs, and siphunculi are very weakly pigmented in apterous viviparous females; (3) setiferous sclerites are absent from dorsum of abdomen in apterous viviparous females; and (4) they are green when alive. It differs from *N. podocarpini* because the alatae do not have dorsal setae on the first tarsal segments.

Neophyllaphis (C.) cuschensis is distinguished from *N. (C.) podocarpini* because: (1) intersegmental sclerites are clearly visible; (2) siphunculi relatively prominent with wide basal diameter; (3) setae usually absent from dorsum of caudal knob; and (4) first tarsal segments without dorsal setae in alatae.

Neophyllaphis (Chileaphis) cuschensis Nieto Nafra and Delfino, **sp. nov.**

Apterous Viviparous Females (Fig. 1). Based on 73 specimens, 38 measured. Body length 1.47-2.25 mm and 1.9-2.7 times hind tibia. Brown when alive, including legs and antennae; thorax and abdomen covered in ash-colored waxy powder, more or less intensively and extensively. Setae generally short, robust, and pointed; ventral setae longer than respective dorsal ones; a few setae present on dorsum of Abd8 and cauda much longer and finer than the rest (Table 1).

Head (Fig. 1B) well-pigmented (dark brown when mounted) bearing numerous dorsal setae (no fewer than 15). Its maximal width, including eyes, 1.2-1.7 times AntIII. Front gently convex. Compound eyes complete. Antennae 0.83-1.28 mm and 0.5-0.7 times body; proximal segments as pigmented as head becoming darker towards apex, though proximal 1/2 AntIII can be slightly less pigmented (Fig. 1A). AntI, AntII and approximately ventral 1/4 and dorsal 1/2-3/4 AntIII smooth; rest of antenna spinulose (Fig. 1C). AntIII 0.27-0.46 mm, 1.6-2.3 times AntIV (0.12-0.21 mm) and 1.6-2.2 AntVI. AntV 0.15-0.23 mm. AntVIb 0.14-0.19 mm and 4.6-10.0 times AntVIpt (0.02-0.03 mm). Rostrum surpassing middle coxae, even reaching hind coxae. Apical rostral segment pigmented (Fig. 1D) as anterior segment

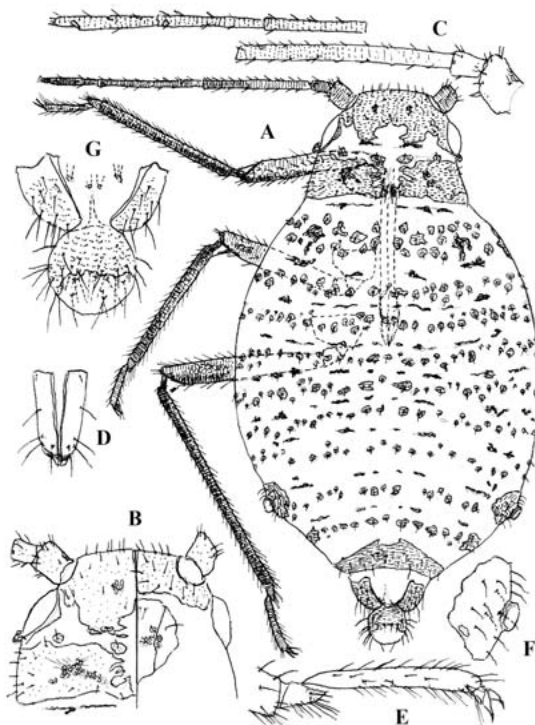


Fig. 1. *Neophyllaphis (Chileaphis) cuschensis* Nieto Nafra & Delfino **sp. nov.**, apterous viviparous female. A, habitus. B, head and prothorax, dorsal and ventral views. C, antenna. D, apical rostral segment. E, tarsus of hind leg. F, siphunculus. G, cauda and anal plate, dorsal view.

and head, 0.08-0.11 mm, 0.4-0.5 times hind second tarsal segment; with edges almost parallel, some scattered spinules and few complementary setae (4 at most).

Prothorax (Fig. 1B) separated from head by pale, fine, irregular line and normally as pigmented as head; marginal papillae absent. Legs completely pigmented, like head, most proximal part of tibia almost black. Hind femur and tibia 0.39-0.58 and 0.63-0.93 mm, respectively. First segment of tarsi with several ventral setae, lacking dorsal setae (Fig. 1E). Second segment of hind tarsi 0.18-0.23 mm.

Mesothorax to AbdVII bearing dorsal setiferous sclerites; marginal sclerites of AbdVII and sometimes those on mesothorax may be joined together. Stigmatic sclerites well-pigmented. Siphunculi almost as dark as head, with one proximal part tapering, 0.06-0.14 mm basal width \times 0.02-0.04 mm high, bearing 10 to 19 setae, and one distal part cylindrical, 0.01-0.02 mm high \times 0.03-0.06 mm wide at opening, with spines annularly ranged (Fig. 1F). AbdVIII dorsum with wide transversal band, almost as pigmented as head, with anterior spinal notch and bearing spines in

TABLE 1. SETA MEASUREMENTS IN *NEOPHYLLAPHIS CUSCHENSIS* AND *NEOPHYLLAPHIS IUIUYENSIS*, APTEROUS VIVIPAROUS FEMALES (AP), ALATE VIVIPAROUS FEMALES (AL), ALATE OVIPAROUS FEMALES (OV) AND MALES (M)

Longest setae on	<i>Neophyllaphis cuschensis</i>		<i>Neophyllaphis iuiuyensis</i>			
	AP	AL	AP	AL	OV	M
Head, dorsal [µm]	18-30	18-25	18	15-18	15-20	13-18
Head, dorsal [times <i>D</i>]	0.8-1.2	0.7-1.0	0.4-0.6	0.5-0.7	0.5-0.7	0.4-0.6
AntIII [µm]	10-23	13-18	15-20	10-15	10-15	13-15
AntIII [times <i>D</i>]	0.5-0.9	0.5-0.8	0.4-0.7	0.3-0.5	0.4-0.6	0.4-0.6
Hind femur, dorsal [µm]	18-28	18-20	15-20	15-20	15-20	15-18
Hind femur, dorsal [times <i>D</i>]	0.8-1.0	0.8-1.0	0.4-0.7	0.5-0.7	0.5-0.7	0.5-0.6
Hind femur, ventral [µm]	(15) 25-40	20-33	30-35	23-40	28-38	30-35
Hind femur, ventral [times <i>D</i>]	0.6-1.8	0.8-1.5	0.7-1.0	0.7-1.3	0.9-1.3	1.0-1.2
AbdIII, dorsal [µm]	10-25	10-23	10-16	18-23	13-23	15-18
AbdIII, dorsal [times <i>D</i>]	0.4-1.0	0.4-1.0	0.3-0.4	0.5-0.8	0.4-0.8	0.5-0.6
AbdVIII, dorsal short [µm]	5-15	10-18	13-15	10-20	13-18	15-18
AbdVIII, dorsal short [times <i>D</i>]	0.2-0.6	0.4-0.9	0.3-0.4	0.3-0.7	0.4-0.6	0.5-0.6
AbdVIII, dorsal long [µm]	13-55	30-40	35-45	34-50	40-45	33-38
AbdVIII, dorsal long [times <i>D</i>]	0.6-2.4	1.2-1.8	0.8-1.2	1.1-1.7	1.3-1.6	1.0-1.3
Cauda, short [µm]	8-25	20-33	20-23	20-23		13-23
Cauda, short [times <i>D</i>]	0.3-1.3	0.8-1.2	0.5-0.7	0.7-0.8		0.5-0.8
Cauda, long [µm]	35-65 (75)	55-60	46-60	48-58		38-53
Cauda, long [times <i>D</i>]	1.4-2.7 (3.0)	2.2-2.5	1.1-1.9	1.6-2.0		1.3-1.9

transversal lines and approximately not aligned 20 setae of different lengths, short and long (Table 1). Setiferous sclerites on ventral side of abdomen, much smaller than dorsal ones. Genital and anal plates dark. Cauda (Fig. 1G) 0.12-0.26 mm, 1.1-1.7 times its basal width, with two easily distinguishable parts separated by strongly pronounced waist; proximal part tapering, 0.08-0.14 mm and 0.4-0.5 times total length of cauda; terminal knob subspherical (0.8-1.4 times as wide as long), 0.7-1.3 times as wide as basal width of cauda and 2.7-5.3 times as wide as the waist; distal part of terminal knob (to 1/2 its length) much less and progressively sclerotized and pigmented than proximal part; it has (20)26-37(43) setae of various lengths, short and long (Table 1), 2-7(10) dorsal.

Alate Viviparous Females (Fig 2). Based on 8 specimens. Body length 2.05-2.38 mm and relatively similar to apterous viviparous females, so the following includes differentiating characters only, excluding obvious differences in the sclerotization of the thorax and presence of wings (Fig. 2A).

Maximal width of head, including eyes, 0.7-0.8 times AntIII. Antennae 1.53-2.02 mm and 0.7-0.8 times body, as pigmented as head. Entire length of dorsal face of AntIII spinulate, 80-90% of length of ventral face bearing 31-50 narrow transverse secondary sensoria (Fig. 2C), the biggest being semi-annular. AntIII 0.59-0.75 mm, 1.8-2.1 times AntIV (0.30-0.43 mm) and 2.8-3.2 AntVI. AntV 0.28-0.38 mm. AntVIb (Fig. 2D) 0.18-0.23 mm and 6.0-9.5 times AntVIpt (0.02-0.04 mm). Apical rostral segment 0.10 mm. Prothorax with a pigmented dorsal arch and without marginal papil-

lae (Fig. 2B). Legs as dark as head. Hind femur and tibia 0.63-0.68 and 1.01-1.11 mm, respectively. Second segment of hind tarsi 0.21-0.23 mm (Fig. 2F). Stigmatic sclerites and intersegmental sclerites present. AbdI bearing marginal plates with a small tuberculiforme projection (Fig. 2A detail) and trapezoid spinal plate with uneven edges; all bearing spinules more or less set out in lines. AbdII-AbdVII with spinal plate going from trapezoidal to rectangular in shape, and some setiferous pleural and marginal sclerites, that may be joined together. AbdVIII with transverse band, also spinulate. Small scattered setiferous sclerites present on ventral side of abdomen. Siphunculi 0.11-0.16 mm with at base and with 10-19 setae (Fig. 2G). Cauda 0.18-0.22 mm long (proximal part 0.08-0.12 mm), 1.7-2.0 times its width at base, maximal width of knob 0.8-1.0 times its length and 2.0-2.7 times width the waist; membranous terminal area absent or very small and dorsally placed (Fig. 2H); with 21-30(36) setae (Table 1), 1-4 of which at most dorsal (Fig. 2I).

Bionomics and Distribution. The specimens form compact groups on young branches of *Podocarpus glomeratus* (in Peru named “romerillo” and “intimpa”) and, to date, only are known in Cusco (Peru). Its distribution very likely coincides with that of the host plant, which also is found in Ecuador and Bolivia. The presence of oviparous females, which we were unable to study due to their deteriorated state of preservation, confirms that it is holocyclic.

Types. The holotype is the apterous viviparous female “PER-23, ap 15” collected on *Podocarpus*

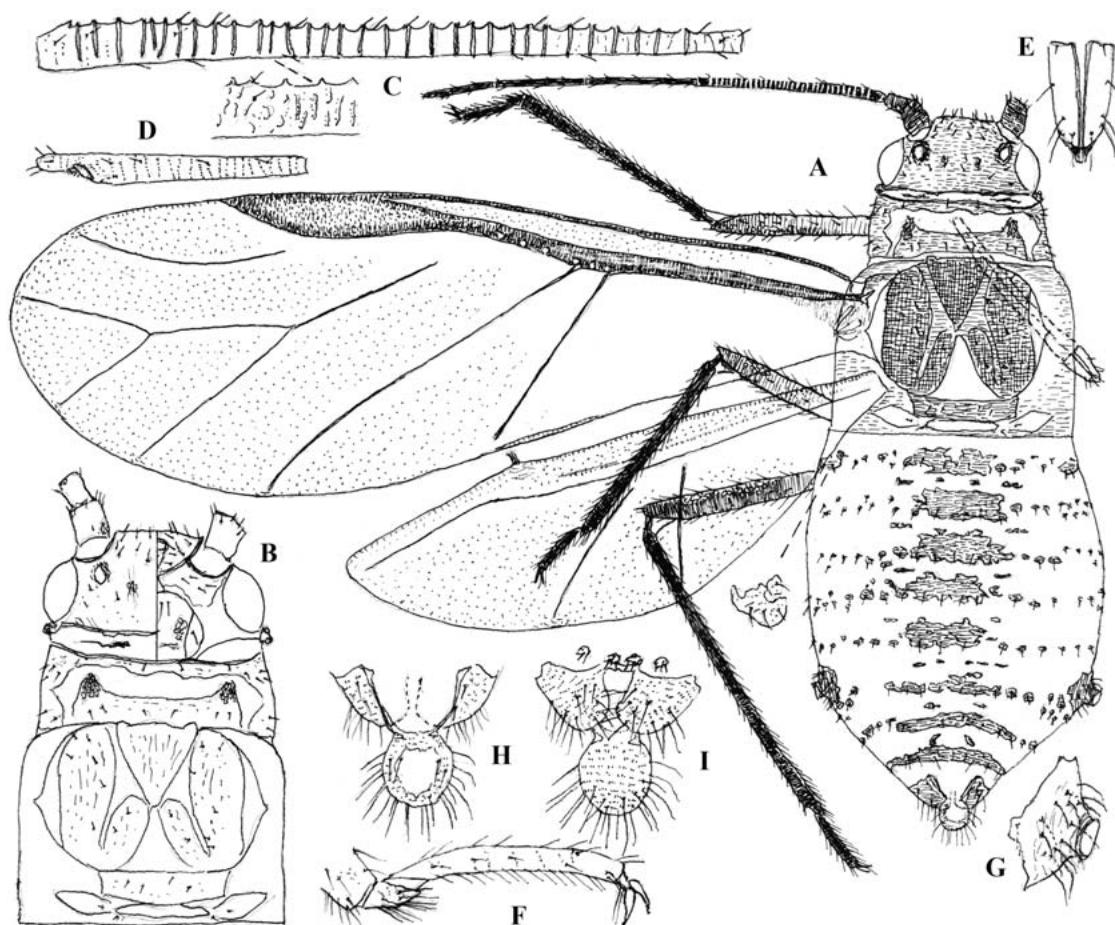


Fig. 2. *Neophyllaphis* (*Chileaphis*) *cuschensis* Nieto Nafra & Delfino **sp. nov.**, alate viviparous female. A, habitus. B, head (dorsal and ventral views) and thorax (dorsal). C, AntIII, with detail. D, AntVI. E, apical rostral segment. F, tarsus of hind leg. G, siphunculus. H, cauda and anal plate, dorsal view. I, gonapophysis, anal plate and cauda, ventral view.

glomeratus in Cusco, 26-VII-2006, Mier Durante and Nieto Nafra *leg.*, deposited in the collection of the University of León (León, Spain). The paratypes are 29 apterous viviparous females and 4 alate viviparous females collected with the holotype; 35 apterous viviparous females collected at the same plant and place, 14-II-2007, A. Rodríguez Berrio and I. Tisoc Dueñas *leg.*; and 8 apterous viviparous females and 4 alate viviparous females collected on same plant in Cusco at the University Campus, 22-XI-1994, Delfino *leg.*; they are deposited in the collections of the authors, "Klauss Raven Büller" Museum of Entomology, Universidad Nacional Agraria La Molina (Lima, Peru), U. S. National Museum of Natural History, Smithsonian Institution aphid collection (Washington D.C., U.S.A.), Muséum national d'Histoire naturelle (Paris, France) and The Natural History Museum (London, U.K.).

Neophyllaphis (*Chileaphis*) *iuuiyensis* Mier Durante and Ortego **sp. nov.**

Apterous Viviparous Female (Fig. 3). Based on 7 specimens. Body length: 1.72-2.50 mm and 2.0-2.8 times hind tibia. When alive, pale green with longitudinal bands of varying intensity, pale-yellowish legs and antennae; thorax and abdomen very lightly covered in ash-colored waxy powder. Setae generally short (Table 1), relatively thick and pointed; ventral ones longer than the respective dorsal ones; a few of the setae on the dorsum of Abd8 and on the cauda much longer and finer than the rest.

Head (Fig. 3A) delicately pigmented (pale creamy yellow when mounted) with numerous dorsal setae (no fewer than 15). Its maximal width, including eyes, 1.1-1.5 times AntIII. Front gently convex. Compound eyes complete. Anten-

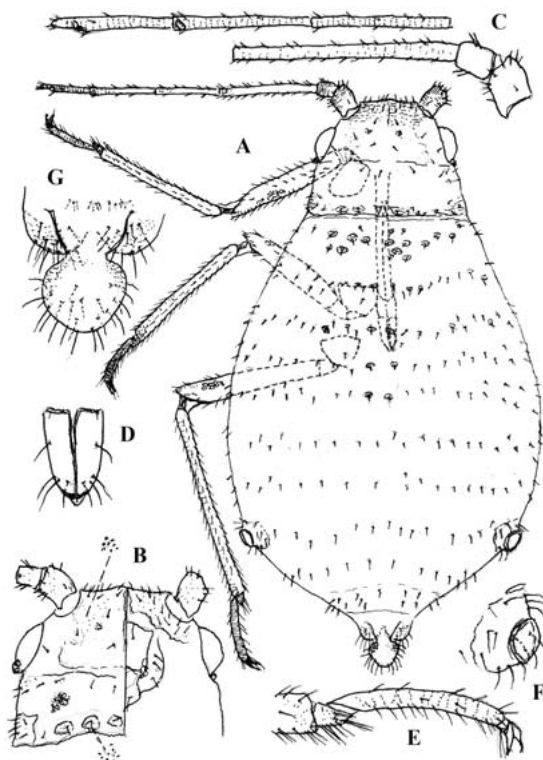


Fig. 3. *Neophyllaphis* (*Chileaphis*) *iuiuyensis* Mier Durante & Ortego **sp. nov.**, apterous viviparous female. A, habitus. B, head and prothorax, dorsal and ventral views, with details. C, antenna. D, apical rostral segment. E, tarsus of hind leg. F, siphunculus. G, cauda and anal plate, dorsal view.

nae 1.22-1.41 mm and 0.5-0.7 times body, basally pigmented as head and getting darker towards apex. AntI, AntII and approximately ventral 1/6 and dorsal 1/2-3/4 of AntIII smooth (Fig. 3C); rest of the antenna spinulate. AntIII 0.38-0.49 mm, 1.6-1.8 times AntIV (0.24-0.28 mm) and 1.9-2.4 AntVI. AntV 0.24-0.28 mm. AntVIb 0.15-0.19 mm and 4.3-6.0 times AntVIpt (0.02-0.04 mm). Rostrum surpassing middle coxae. Apical rostral segment (Fig. 3D) 0.09-0.10 mm, 0.3-0.4 times second segment of hind tarsi, pigmented as anterior segment and somewhat more than head, with edges almost parallel, some scattered spinules and few complementary setae (no more than 4).

Legs slightly more pigmented than head, tarsi slightly darker. Hind femur and tibia 0.58-0.62 and 0.82-0.91 mm, respectively. First segment of tarsi (Fig. 3E) with several ventral setae and without dorsal setae. Second segment of hind tarsi 0.24-0.27 mm.

Prothorax separated from head by fine, pale irregular line, somewhat enlarged on both sides; marginal papillae absent (Fig. 3B). Body dorsum

completely pale, frequently no sclerites discernible. Siphunculi (Fig. 3F) slightly paler than head, but distinguishable from outline, its proximal part wide and tapering (0.10-0.13 mm basal width \times 0.02-0.03 mm high) and with 10 to 16 setae, the cylindrical distal part 0.01 mm high and 0.04-0.06 mm wide at the opening. AbdVIII dorsum with about 10-15 setae, not aligned and varying in length, short and long (Table 1). Genital and anal plates more or less as pigmented as head. Cauda 0.08-0.19 mm, 0.9-1.1 times its basal width, with two easily distinguishable parts separated by a waist (Fig. 3G); proximal part tapering, 0.07-0.09 mm and 0.4-0.5 times total length of cauda; knob subspherical (maximal width 1.2-1.7 times its length), 0.8-1.2 times as wide as basal width of cauda and 2.2-3.0 times width the waist. Distal part of knob (to 1/2 its length) less sclerotized than proximal part and even less pigmented. Cauda with 16-30 setae of different lengths, short and long (Table 1) with 0-4 dorsal; membranous part lacking setae except for areas near the limit with sclerotized part.

Alate Viviparous Females (Fig. 4 A-H). Based on 40 specimens. Body length 1.94-2.85 mm and relatively similar to apterous viviparous females, so the following contains differentiating characters only, excluding the obvious differences in sclerotization on the thorax and the presence of wings (Fig. 4A).

When alive, head and thorax brown, abdomen green with longitudinal brown band, both covered in light ash-colored powder; legs and antennae brown. Maximum width of head, including eyes, 0.7-0.8 times AntIII. Antennae 1.66-2.16 mm and 0.7-0.9 times body, as pigmented as head. Entire length of dorsal face of AntIII spinulate, 31 to 64 narrow transverse secondary sensoria (the biggest being semi-annular) occupying 79-91% length of ventral face (Fig. 4C). AntIII 0.58-0.76 mm, 1.3-1.8 times AntIV (0.33-0.44 mm) and 2.5-3.2 AntVI. AntV 0.34-0.44 mm. AntVIb 0.17-0.24 mm and 5.2-7.7 times AntVIpt (0.03-0.04 mm) (Fig. 4D). Apical rostral segment 0.08-0.10 mm. Prothorax (Fig. 4B) with spinal-pleural plate and 2 marginal plates; marginal papillae absent. Legs more or less homogeneously brown. Hind femur and tibia 0.68-0.81 and 1.04-1.26 mm, respectively. Second segment of hind tarsi 0.22-0.28 mm (Fig. 4F). Stigmatic sclerites present and inter-segmental sclerites absent. AbdI bearing marginal plates with small tuberculiform projection (Fig. 4A detail) and a trapezoidal spinal-pleural plate with very uneven edges; AbdII-(AbdIV)AbdVI-(AbdVII) with spinal or spinal-pleural plates; all exhibiting spinules more or less set out in lines; if plates absent setiferous spinal sclerites are present and sometimes partially joined together. AbdVIII with a narrow transverse band, spinulose. In addition small scattered setiferous sclerites also sometimes present on dorsum and

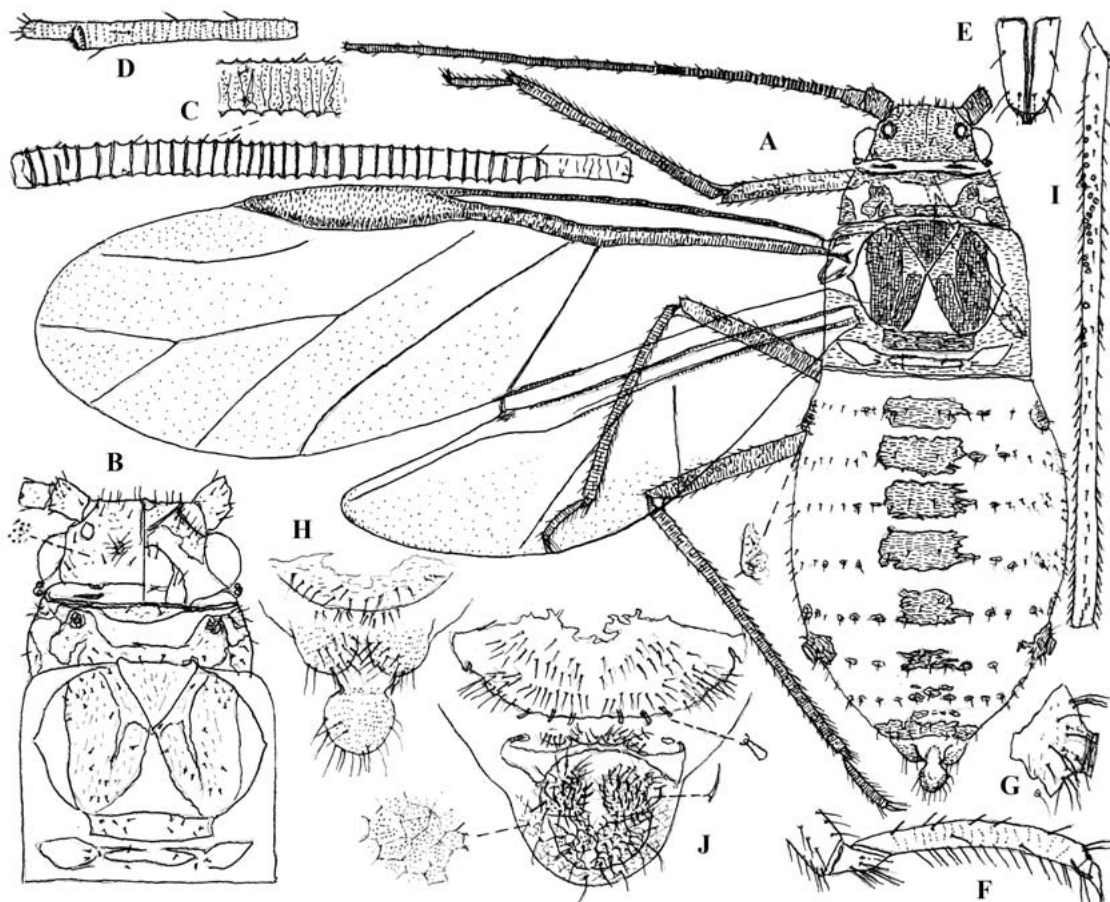


Fig. 4. *Neophyllaphis* (*Chileaphis*) *iuiuyensis* Mier Durante & Ortego **sp. nov.**, alate viviparous female (A-H) and alate oviparous female (I-J). A, habitus. B, head (dorsal and ventral views) and thorax (dorsal). C, AntIII, with detail. D, AntVI. E, apical rostral segment. F, tarsus of hind leg. G, siphunculus. H, apex of the abdomen, ventral view. I, tibia of hind leg. J, apex of the abdomen, ventral view, with details.

ventral side of abdomen. Siphunculi 0.08-0.15 mm diameter at base and with 6-16 setae (Fig. 4G). Cauda 0.14-0.19 mm long (proximal part 0.06-0.09 mm) and 0.8-1.1 times width at base, maximal knob width 1.0-1.7 times its length and 1.3-2.4 times waist width (Fig. 4H); terminal membranous area absent or very small; it has 10-26 setae, 0-4 of which dorsal (Table 1).

Oviparous Alate Females (Fig. 4 I-J). Based on 11 specimens. Body length 2.20-2.53 mm and similar to apterous viviparous females, so only the differential characters are given below.

Antennae 1.86-2.15 mm and 0.7-0.9 times body. AntIII 2.4-3.1 times AntVI with 21-41 secondary sensoria not reaching distal 11-21% of segment, AntIV and AntV 0.41-0.49 and 0.38-0.45 mm, respectively. Apical rostral segment 0.07-0.10 mm. Legs brown but less pigmented than head, especially coxae, trochanters and proximal part of femora. Hind tibiae (Fig. 4I) not expanded and bear-

ing 20-55 scent plates (very exceptionally, 1 leg of 1 specimen with 1). Middle tibiae sometimes with scent plates, 5 at most. AbdVIII with setiferous sclerites separated or grouped together. Genital plate very large, transversal-rectangular, pale in median-anterior region and almost black in an sinuate posterior part, with small club-shaped setae at the edge (Fig. 4J). Cauda with semicircular outline, with microsculpture developed at a diffused reticulate pattern, a small, strongly scarious protruberance on lower-side of cauda and approximately 20 to 60 setae (Fig. 4J).

Alate Males. Based on 9 specimens. Body length 2.00-2.35 mm, relatively similar to alate viviparous females, so only differential characters are given below, excluding the obvious differences such as genital plate absent and male genitalia present.

Maximum width of head, including eyes, 0.6-0.7 times AntIII. Antennae 2.10-2.30 mm and 1.0-1.1 times body. AntIII, AntIV, AntV and AbtVIb,

respectively 0.73-0.84, 0.47-0.53, 0.44-0.48, 0.23-0.26 and 0.04 mm long with 68-96, 13-25, 11-20 and 2-5 almost rectangular secondary sensoria set out transversely. Hind femur and tibia 0.68-0.81 and 1.04-1.26 mm, respectively. Second segment of hind tarsi 0.22-0.27 mm. Cauda 0.12-0.16 mm long, with its proximal part 0.05-0.07 mm long.

Bionomics and Distribution. The species forms compact groups on young branches of the conifer *Podocarpus parlatorei* (named "pino del cerro" in Argentina) and is currently known only in San Salvador de Jujuy (Jujuy, Argentina). Its distribution may well coincide with that of the host plant, which is present in several Argentinean provinces and Bolivia. The species is holocyclic.

Types. The holotype is the apterous viviparous female "ARG-1197, áp 5", collected on *Podocarpus parlatorei* in San Salvador de Jujuy, Los Perales Botanic Park, 8-XI-2006, Mier Durante, Ortego and Nieto Nafria *leg.*, deposited in the collection of the University of León (León, Spain). The paratypes are 6 apterous viviparous females, 40 alate viviparous females, 11 alate oviparous females and 9 alate males, collected with the holotype and deposited in the collections of the authors and in the "Klauss Raven Büller" Entomology Museum, Universidad Nacional Agraria La Molina (Lima, Peru), U.S. National Museum of Natural History, Smithsonian Institution aphid collection (Washington D.C., U.S.A.), Muséum national d'Histoire naturelle (Paris, France) and The Natural History Museum (London, U.K.).

ACKNOWLEDGMENTS

We thank A. Rodríguez Berrio (Universidad Nacional Agraria La Molina, Lima, Perú), Isolina Tisoc Dueñas (Universidad Nacional San Antonio Abad, Cusco, Perú) for help in collecting specimens; and C. Vergara Cobián and G. Miller for providing specimens of the collections of the "Klauss Raven Büller" Entomological Museum, Universidad de La Molina, and the National Museum of Natural History of Washington, respectively. This paper was funded by the Regional Government of Castilla y León, Spain (grants LE45/02 and LE034A05 to Prof. M. P. Mier Durante).

REFERENCES CITED

- BLACKMAN, R. L., AND V. F. EASTOP. 1994. Aphids on the World's Trees. An Identification and Information Guide. CAB International, Wallingford. 8 + 988 pp., 16 plates.
- CARRILLO, R. 1980. Aphidoidea de Chile III. *Agro Sur* 8(1): 21-29.
- ESSIG, E. 1953. Some new and noteworthy Aphididae from Western and Southern South America. *Proc. Californian Acad. Sci. (Fourth Series)* 28(3): 59-164.
- INSTITUTO DE BOTÁNICA DARWINION. 2007. Flora de la República Argentina. Catálogo de Plantas Vasculares. On line: <http://www.darwin.edu.ar>. Consulted April 2, 2007.
- HILLE RIS LAMBERS, D. 1967. On the genus *Neophyllaphis* Takahashi, 1920 (Homoptera Aphididae) with descriptions of two new species. *Zoologische Mededelingen* 42(7): 55-66.
- LIMONTA, L. 1990. Callaphididae (Aphidoidea) nuovi per l'Italia. *Bolletino di Zoologia Agraria e di Bachi-cultura, Serie II* 22(1): 93-99.
- MISSOURI BOTANICAL GARDEN. 1999. w3TROPICOS. On line: <http://www.tropicos.org/>. Consulted April 2, 2007.
- NIETO NAFRÍA, J. M., AND M. P. MIER DURANTE. 1998. Hemiptera. Aphididae. I. In M. A. Ramos et al. [eds.] *Fauna Ibérica*, vol. 11. Museo Nacional de Ciencias Naturales (CSIC), Madrid. 424 pp.
- QIAO, G., G. ZHANG, AND Y. CAO. 2001. The genus *Neophyllaphis* Takahashi (Homoptera: Aphididae) from China with description of one new species. *Oriental Insects* 35: 91-96.
- QUEDNAU, F. W., AND G. REMAUDIÈRE. 1994. Le genre sud-américain *Neuquenaphis* E. E. Blanchard, description de deux nouvelles espèces et définition de nouvelles sous-familles d'Aphididae (Homoptera). *Bull. Soc. Entomol. France* 99(4): 365-384.
- REMAUDIÈRE G., AND M. REMAUDIÈRE. 1997. Catalogue des Aphididae du Monde/Catalogue of the World's Aphididae. Homoptera Aphidoidea. Institut National de la Recherche Agronomique. Paris. 473 pp.
- RUSSELL, L. M. 1966. New synonymy and new name combination in *Neophyllaphis* Takahashi. *Proc. Entomol. Soc. Washington* 68(4): 340.
- RUSSELL, L. M. 1982. The genus *Neophyllaphis* and its species (Hemiptera: Homoptera: Aphididae). *Florida Entomol.* 65(4): 538-572.
- STARK SCHILLING, D., AND C. LE-QUESNE GEIR. 2007. Enciclopedia de la flora chilena. On line <http://www.florachilena.cl>. Consulted April 2, 2007.