

JUAN MANUEL NIETO NAFRÍA (*) - NICOLÁS PÉREZ HIDALGO (*)

A NEW APHID SPECIES (HEMIPTERA, APHIDIDAE) LIVING ON *CENTAUREA* FROM IRAN

(*) *Departamento de Biodiversidad y Gestión Ambiental, Universidad de León, 24071, León, Spain*; e-mail: jmnien@unileon.es / nperh@unileon.es

Nieto Nafría, J.M., Pérez Hidalgo N. – A New aphid species (Hemiptera Aphididae) living on *Centaurea* from Iran.

Macrosiphoniella (Papillomyzus) iranica sp. n. (Aphididae Macrosiphini) is described from Iranian apterous viviparous females caught on *Centaurea* sp. and conserved in the Natural History Museum in London and in the *Muséum national d'Histoire naturelle* in Paris. The features of the new species are compared with those of the other 6 species of the subgenus *Papillomyzus* which are hosted on *Centaurea* and on other Cardueae, Cynareae or Anthemideae (Asteraceae) species and are distributed along a Mediterranean-Pontian-Turanian-East Palaearctic band.

KEY WORDS: Aphids, Aphididae, Macrosiphini, *Centaurea*, Iran.

INTRODUCTION

Macrosiphoniella Del Guercio, 1911 is one of the most complex genera of Macrosiphini (Aphididae Aphidinae); above it BLACKMAN and EASTOP (2006 [2013]) say: «About 115 palaeartic and 5 nearctic species, mostly having siphunculi and cauda similar in length, with siphunculi reticulated over distal half. Most species feed on Anthemideae and have a stiletto-shaped R IV+V. At least half the species feed on *Artemisia* and 6-8 species are known from each of *Achillea*, *Aster*, *Helichrysum*, *Centaurea*, and other Cynareae, with fewer from *Chrysanthemum* and other Anthemidae». It is habitually divided in 7 subgenera, the nominotypical one, that includes the most part of the species, and *Asterobium* Hille Ris Lambers, 1938, *Chosoniella* Szelegiewicz, 1980, *Papillomyzus* Szelegiewicz, 1963, *Phalangomyzus* Börner, 1939, *Ramitrichophorus* Hille Ris Lambers, 1947 and *Sinosiphoniella* Tao, 1963, which have well defined distinctive features.

Papillomyzus is characterized for dorsal setae arising from conical or papilliform tubercles, which give the aphids a very peculiar look and the subgenus name, and also for the absence of dorsal setiferous sclerites, the short length of the processus terminalis of antennal segment VI, the triangular ultimate rostral segment and the lanceolate cauda. The host plants belong to several genera of Anthemideae, Cardueae or Cynareae (Asteraceae) and as a whole are distributed along a band from western Mediterranean (France) to eastern Palaearctic (North Korea) with the most part of the records concentrated in an East Mediterranean-Pontian-Turanian area.

The subgenus currently includes 6 valid species: *M. (P.) arctica* Pashtshenko, 1999, *M. (P.) confusa* Holman, Lee & Havelka, 2006, *M. (P.) papillata* Holman, 1962, *M. (P.) riedeli* Szelegiewicz, 1963 (type species of the subgenus), *M. (P.) tuberculata* (Nevsky, 1928) and *M. (P.) tuberculatumartemismicola* Bozhko, 1961.

M. arctica, *M. confusa* and *M. tuberculatumartemismicola* live on Anthemideae; *M. papillata*, *M. riedeli* and the new species are hosted on Cardueae, and *M. tuberculata* on Cardueae and Cynareae species. *M. papillata* presents wider distribution than the other five species with records from

France, Greece, Bulgaria, Ukraine, Turkey, Syria, Kazakhstan and Iran while, in contrast, *M. arctica* and *M. confusa* have been recorded only from the north-east of Siberia and from North Korea, respectively. From Iran were already known the mentioned *M. papillata* as well as *M. riedeli*, *M. tuberculata* and *M. tuberculatumartemismicola*.

In addition, an undescribed species from Iranian specimens caught on *Centaurea* sp. (Cardueae), which are conserved in the Natural History Museum collection [N.H.M.], is admitted by BLACKMAN and EASTOP (2006) in their key of apterae living on *Centaurea*. These specimens and other one also from Iran that is conserved in the collection of the *Muséum national d'Histoire naturelle* in Paris (*M.N.H.N.*) have been studied and a new species is here described.

MATERIALS AND METHODS

STUDIED MATERIAL: 1) from the N.H.M. collection, seven apterous viviparous females, mounted in 4 slides, which were labelled “*iranica* sp. n.” by D. Hille Ris Lambers; 2) from the *M.n.H.n.* collection, one apterous viviparous female in one slide labelled *Uromelan* by G. Remaudière. Collecting data are detailed in the types section.

Methods habitually used in aphid-taxonomic studies have been utilized. Articles or books by NEVSKY (1928), HILLE RIS LAMBERS (1948), BOZHKO (1957, 1961), HOLMAN (1962), SZELEGIEWICZ (1963), REZWANI and LAMPEL (1990), LAMPEL and REZWANI (1993), PASHTSHENKO (1999), HOLMAN *et al.* (2006), BLACKMAN & EASTOP (2006 [2013]), HOLMAN (2009) and FAVRET (2013) have been consulted.

RESULTS AND DISCUSSION

Macrosiphoniella (Papillomyzus) iranica sp. n.

APTEROUS VIVIPAROUS FEMALES – Colour in life unknown; like other species of the subgenus they possibly are pale green with whitish cereous powder. When mounted (Figs. I

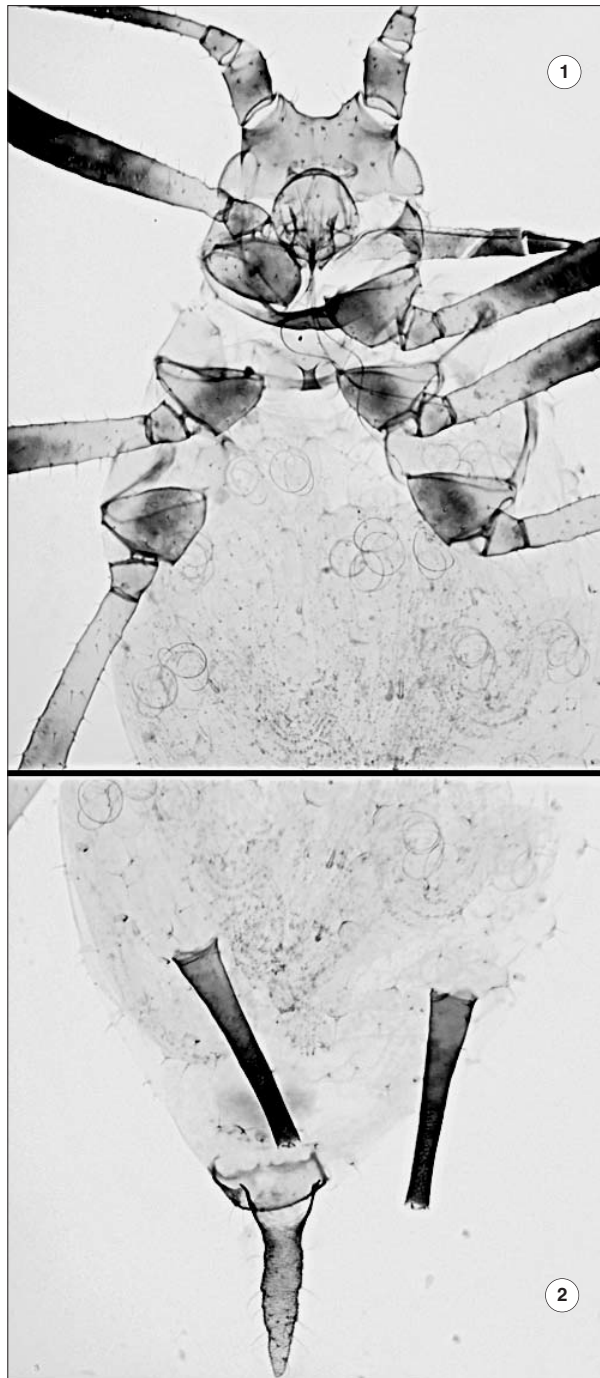


Fig. I – *Macrosiphoniella (Papillomyzus) iranica* sp. n.: anterior part (1) and posterior part (2) of the body.

and II,1), pale yellow thorax and abdomen and more or less brown pigmented head, antenna (in part), legs (in part), furcae, spiracular sclerites, siphunculi, genital and anal plates and cauda (see below). Body 2.775-3.225 mm long, 2.70-3.13 and 1.38-1.72 times the metathoracic femur and tibia, respectively. Head and antennal segments I and II brown, other antennal segments more or less pigmented, but with relatively pale most proximal part of segment III (Fig. II,1). Frontal sinus wide divergent, a small medial tubercle is present. Dorsum of head with 2+2+4 setae, 55-70 μm , with blunt or evanescent apex, similar in shape to the other body-dorsal and appendicular setae. Antennae 2.875-3.210 mm, 0.93-1.08 times the

body length. Antennal segments III, IV and V, base and processus terminalis of segment VI, 0.78-0.85, 0.55-0.68, 0.46-0.55, 0.20-0.25 and 0.59-0.68 mm, respectively, being processus terminalis 0.73-0.82 times the III article and 2.46-2.83 times the base. Antennal segment III with 19-26 setae, the longest one 28-45 μm and 0.7-1.2 times the basal diameter of that segment; 28-39 secondary sensoria are extended over 71-95% of segment length; they are circular and small (Fig. II, 2). Rostrum brown, overlapping the insertion of metathoracic coxae. Ultimate rostral segment pointed and thin triangular (Fig. II, 3), 0.16-0.18 mm, 2.25-2.77 times its basal width and 1.78-2.40 and 1.39-1.70 times antennal I and base of VI respectively; it carries 6-8 accessory setae. Coxae and trochanters brown, like cephalic dorsum and other pigmented portions of legs (Fig. I, 1). Posterior seta on metathoracic trochanter 50-65 μm and 0.6-0.8 times the trochanter-femoral suture. Pro-, meso- and meta-thoracic femora respectively pigmented on distal 3/4, 2/3 and 1/2 approximately, always with a sub-apical yellow spot. Middle-dorsal, middle-ventral and distal setae on metathoracic femora 25-45, 35-45, 15-45 μm , respectively. Tibiae pale on most part of their length, with small basal and distal portions pigmented. Middle dorsal setae of metathoracic tibiae 40-50 μm and 0.7-0.9 the width of tibiae at setal insertion point. Tarsi brown. Tarsal formula 3.3.3. Second segment of metathoracic tarsi 0.17-0.19 mm and 0.97-1.06 times ultimate rostral segment. Most part of dorsal setae on meso- and metathorax and abdominal segments I-VI arising from blunt conical (more or less papilliform) tubercles. Abdominal segment III with 2-3 pleural, 2-3 pleural and 3 marginal setae on each side; longest spinal ones 55-70 μm , 1.3-2.0 times the basal diameter of antennal III. Spiracular apertures reniform and placed in posterior part of respective plates, which are small and delicately pigmented. Pre-siphuncular sclerites feebly insinuated. Siphunculi brown to dark brown (Figure I, 2); when they are intensively pigmented then the proximal 1/4-1/3 is less pigmented; they are 0.58-0.71 mm long, 3.9-4.5 times the basal width, 0.19-0.22 times the body and 0.72-0.80 times the antennal III, they are subcylindrical with enlarged basis, 2.2-3.0 times the narrowest width at the middle of the reticulate part which is 0.9-1.3 times the width of metathoracic tibiae at middle; they are reticulated on 0.40-0.48 of the length (Fig. II, 4). Abdominal segments VII and VIII with 7-11 and 4-6 setae respectively, the longest one 50-70 μm and 1.2-2.0 times the basal width of antennal III. Genital plate smoky, with 2 (rarely 1 or 3) discal and 7-10 marginal setae. Anal plate as dark as cauda which is paler than siphunculi when these are dark brown. Cauda 0.53-0.59 mm long, 2.23-2.74 times its basal width, and 0.86-0.95 times the siphuncular length, ensiform, with a small narrowing; it carries 16-25 setae (Fig. II, 1).

BIOLOGY AND DISTRIBUTION – The species is currently known only on *Centaurea* in Karaj (Alborz province) and Menjil (Gilan province), two Iranian localities to the West of Tehran.

ETIMOLOGY – The specific name means natural from Iran; it was chosen by Hille Ris Lambers (see “Material and Methods”). It is in feminine because *Macrosiphoniella* is feminine (CORTES GABAUDAN *et al.*, 2011).

TYPES – Holotype: apterous viviparous female (number 7 of the measurements series), IRAN, 16 km N of Karaj, *Centaurea* sp., 5-V-1968, v.d.Bosch *leg.*, Natural History Museum collection, London. Paratypes: 7 apterous viviparous females; 6 with same data of the holotype and also conserved in N.H.M. in London; 1 female: IRAN,

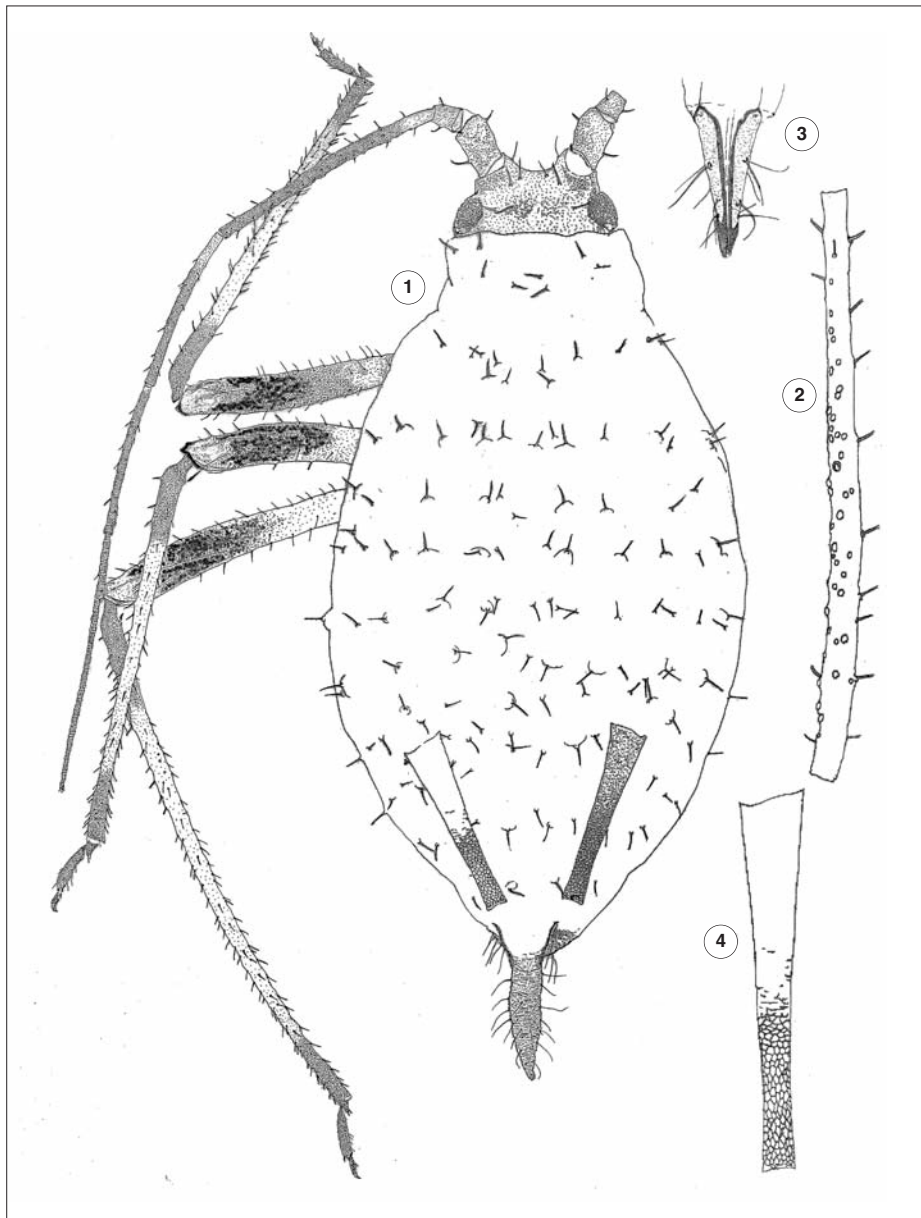


Fig. II – *Macrosiphoniella (Papillomyzus) iranica* sp. n.: habitus, with left siphunculi without pigmentation in order to see the reticulation (1); antennal segment III without pigmentation (2); ultimate rostral segment (3); left siphunculi (4).

Manjil, on *Centaurea*, 12-V-1959, Remaudière leg., *Muséum national d'Histoire naturelle* collection, Paris.

DISCUSSION – *Macrosiphoniella (P.) iranica* sp. n. can be distinguished from the other species of the subgenus *Papillomyzus* as follows:

- 1) *M. iranica* has bicoloured hind tibiae, with dark proximal and distal sections and an extended pale medial section. Hind tibiae of *M. papillata*, *M. riedelei* and *M. tuberculatumartemismicola* are homogeneous dark. In addition, the percentage of the siphuncular length occupied by the reticule is 40-48 in *M. iranica* versus 27-37 in *M. papillata*, 24-42 in *M. riedelei* and approximately 25 in *M. tuberculatumartemismicola*.
- 2) *M. iranica* has 28-39 secondary sensoria extended over the 71% of the segment length at least, while *M.*

tuberculata has 13-25 sensoria that does not exceeding the 70% of this length, and *M. arctica* and *M. confusa* have only 4-6 secondary sensoria limited to a proximal portion of the segment. In addition, the ratios: (i) siphunculus/cauda is 1.05-1.16 in *M. iranica* and 1.4-1.5 in *M. tuberculata*; (ii) processus terminalis/base of antennal segment VI is 2.5-2.8 in *M. iranica* and more than 3.2 times in *M. arctica* and *M. confusa*.

ACKNOWLEDGMENTS

The Authors wish to thank the Natural History Museum in London and the *Muséum national d'Histoire naturelle* in Paris for the facilities given to the study of the slides of the respective aphid collections.

REFERENCES

- BLACKMAN R.L., EASTOP V.F., 2006 – *Aphids on the World's herbaceous plants and shrubs. Volume 1 Host Lists. Volume 2 The Aphids.*- John Wiley and Sons Ltd. Chichester, United Kingdom, 8+1439 pp. Actualized 2013: Aphids on the World's plants.- An online identification and informative guide. <http://www.aphidsonworldsplants.info> (consulted July 2013).
- BOZHKO M.P., 1957 – *Materialy ky izucheniju fauny tlej (Aphidoidea) Kryma.*- Trudy N.-I. Instituta Biologii I Biologicheskogo Fakulteta Universiteta A. M. Gorkogo, 30: 207-222.
- BOZHKO M.P., 1961 – *Novyj rod I novye vidy tlej (Homoptera, Aphidoidea) s juga Ukrainy, Moldavii u Predkavkazia.*- Horae Societas Entomologica Rossica, 48: 5-37.
- CORTES GABAUDAN F., NIETO NAFRÍA J.M., FAVRET C., BARBAGALLO S., SANO M., STEKOLSHCHIKOV A.V., 2011 – *Etymology and gender of genus-group names. Etimología y género gramatical de los nombres de los taxones de nivel género.* In: Nieto Nafría, J.M., Favret, C. (Eds.) - Registers of family-group and genus-group taxa of Aphidoidea. Registros de los taxones del nivel familia y del nivel género de Aphidoidea (Homoptera Sternorrhyncha).- Universidad de León, Leon (Spain): 405-463.
- FAVRET C., 2013 – *Aphid Species File 5.0/5.0.*- <http://Aphid.SpeciesFile.org> (consulted July 2013).
- HILLE RIS LAMBERS D., 1948 – *On Palestine aphids, with descriptions of new subgenera and new species (Homoptera, Aphididae).*- Transactions of the Royal Entomological Society, London, 99: 269-289.
- HOLMAN J., 1962 – *Three new aphid species of the subfam. Dactynotinae from the Crimea (Homoptera).*- Časopis Československé Společnosti Entomologické, 59 (1): 28-37.
- HOLMAN J., 2009 – *Host plant catalog of aphids. Palaearctic Region.*- Springer Science and Business Media B.V. Without locality (Germany).
- HOLMAN J., LEE S., HAVELKA J., 2006 – *A revision of the genus Macrosiphoniella Del Guercio (Hemiptera: Aphididae) from the Korean Peninsula, Part I: subgenera Asterobium, Chosoniella, Papillomyzus, Phalangomyzus, Siphoniella.*- Proceedings of the Entomological Society of Washington, 108 (1): 174-197.
- LAMPEL G., REZWANI A., 1993 – *Further new species of Uroleucon Mordv. (Homoptera: Aphididae) from Iran.*- Mitteilungen der Schweizerischen Entomologischen Gesellschaft, 66: 53-61.
- NEVSKY V.-P., 1928 – *The plant-lice of Middle-Asia I.*- Entomologische Mitteilungen [Berlin-Dahlem], 17 (3): 182-199.
- PASHTCHENKO I.F., 1999 – *Tli roda Macrosiphoniella (Homoptera, Aphididae) daliago Vostoka Rosii. Soobshchenie 3. podrodi Asterobium, Chosoniella, Papillomyzus I Phalangomyzus.*- Zoologicheskij Zhurnal, 78 (1): 37-41.
- REZWANI A., LAMPEL, G., 1990 – *Three new aphids from Iran belonging to the genera Uroleucon Mordv. and Aphis L. (Homoptera: Aphididae).*- Mitteilungen der Schweizerischen Entomologischen Gesellschaft, 63: 241-243.
- SZELEGIEWICZ H., 1963 – *Aphididae (Homoptera) aus Vorderasien, samt Beschreibung einer neuen Untergattung und Art.*- Annales Zoologici (Warsawa), 21 (7): 53-60.