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NEW APHID RECORDS (HEMIPTERA APHIDIDAE) FROM ALGERIA AND THE NORTHERN AFRICA

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Pérez Hidalgo N., Bouhraoua R.T., Boukris F., Benia F., Khelil M.-A., Pujade-Villar J. – New aphid records (Hemiptera Aphididae) from Algeria and the Northern Africa.

Five species of aphids are recorded for the first time in Algeria: *Aphis billerislambersi* Nieto Nafria & Mier Durante, *Hyalopterus amygdali* ((E.) Blanchard), *Hyalopterus persikonus* Miller, Lozier & Footitt, *Melanaphis donacis* (Passerini) and *Uroleucon aeneum* (Hille Ris Lambers). The records of *A. billerislambersi*, *H. persikonus* and *U. aeneum* are also new to the Northern Africa. Two new plant-aphid relationships, previously unknown anywhere in the world, are established for two polyphagous species: *Macrosiphum euphorbiae* on *Galactites tomentosa* and *Myzus persicae* on *Thapsia villosa*. 28 plant-aphid relationships are also recorded for the first time in Algeria.

KEY WORDS: aphids, new records, aphid-plant relationships, Algeria, North African countries.

The knowledge of the aphid fauna of the north of Africa is at the 21st Century very scanty because of principally two factors: (i) the shortage of faunistic studies in the zone and (ii) the dispersion and antiquity of the aphid bibliography in some countries. According to AHMEID AL-NAGAR and NIETO NAFRÍA (1998) in a first approximation to the Maghreb aphid fauna the number of aphids in this region consists in around 200 species: 158 were present in Morocco, 99 in Egypt, 73 in Libya, 44 in Tunisia and 28 in Algeria.

In Tunisia since then, and thanks to the studies realized on the diversity of aphids tied to cultures of potato, that number has raised up to 103 species (BOUKHRIS-BOUHACHEM *et al.*, 2007). In Algeria, after a good bibliographical account and after 40 years of studies referred also to the agriculture, the number has increased up to 120 (LAAMARI *et al.*, 2010; BENIA & BOUNECHADA, 2011). To that number the Nearctic species, *Aphis illinoisensis* Shimer has to be added as from Turkey it has been colonizing almost all of the countries of the north of Africa: Tunisia (KAMEL-BEN HALIMA & MDELLEL, 2010), Algeria (LAAMARI & COEUR D'ACIER, 2010) and Libya (HAVEKKA *et al.*, 2011), being feasible that it is present in Egypt and Morocco because it has already reached the Iberian Peninsula (PÉREZ HIDALGO *et al.*, 2011).

Nevertheless, the knowledge of the rest of the countries of the Maghreb (Morocco, Egypt and Libya) has not experienced the same level up to the date, assuming that the number of species increases if taxonomic and faunistic studies are realized or the studies about depredation or parasitism associated with agricultural and/or forest cultures are continued (LAAMARI *et al.*, 2011; BENIA & BOUNECHADA, 2011).

In the data concerning the entomological fauna of Tafat National Forest (BENIA & BOUNECHADA, 2011) there are

innovations and/or first records for the Algerian aphid fauna which unfortunately were not well-defined; in this way the species *Pterochloroides persicae* (Cholodkovsky), *Thelaxes suberi* (Del Guercio) (cited as *Thelaxes* sp.) and *Wablgreniella nervata* (Gillette) were mentioned for the first time in Algeria.

MATERIALS AND METHODS

In the frame of the doctoral study on the parasitisation of aphids in Algeria carried out by the third author, samples were collected from 27.iii.2009 to 9.vi.2009 and from 25.v.2010 to 30.vi.2010 in several localities of the provinces of Tlemcen (Ain Fezza, Ain Youcef, Amieur, Ben Sekrane, Béni Boublène, Béni Snouss, El Fhoul, Ghazaouet, Honaine, Nedroma, Oued Chouli, Sebdou, Sidi Said, Tlemcen, Oulhasa) and Aïn Témouchent (El Amria, Rechgoune) to the Northwest of Algeria.

The aphids were identified using the keys of the monographs of BLACKMAN and EASTOP dealing with the aphids on the world's trees (1994, 2010), with the aphids on crops and herbaceous plants (2000) and with the aphids on shrubs (2006); for the plant(s) hosts QUÉZEL and SANTA (1962-1963) and MAIRE (1952-1987) were consulted. The taxonomic and nomenclatural criteria followed by the AA. are the same than those in the Iberian Fauna (<http://iberfauna.mncn.csic.es/>) and in Fauna Europaea (<http://www.faunaeur.org/>) projects.

Aphid material is deposited in the Department of Biodiversity and Environmental Management of the University of Leon (Spain).

RESULTS

From 65 samples, 23 species of aphids have been identified and 58 plant-aphid relationships established. Five species are new records from Algeria: *Aphis billerislambersi* Nieto Nafria & Mier Durante, *Hyalopterus amygdali* ((E.) Blanchard), *Hyalopterus persikonus* Miller, Lozier & Foottit, *Melanaphis donacis* (Passerini) and *Uroleucon aeneum* (Hille Ris Lambers), of which *A. billerislambersi*, *H. persikonus* and *U. aeneum* are also new to the north of Africa.

Aphis billerislambersi is monoecious and holocyclic on species of *Euphorbia* (*E. helioscopia*, *E. hirsuta*, *E. nicaensis*, *E. segetalis*...) and it is distributed in Spain (included Balearic and Canary Islands), France, Italy and Saudi Arabia (GARCÍA PRIETO & NIETO NAFRÍA, 2005).

Hyalopterus persikonus has been described recently after the combination of a molecular and morphological study inside the genus. *H. persikonus* differentiates from the other two species of the genus (*H. amygdali* and *H. pruni*), besides for a few light morphologic differences, for colonizing principally *Prunus persica* and *P. armeniaca*, whereas *H. amygdali* lives on *P. dulcis* and *P. armeniaca*, and *H. pruni* lives on *P. domestica* (see also LOZIER *et al.*, 2011). *Hyalopterus persikonus* has been described on specimens from Greece, Italy, Spain, Republic of Georgia, Iran, Afghanistan and Iraq.

Uroleucon aeneum (Hille Ris Lambers) lives on upper parts of stems of *Carduus*, *Cirsium*, *Onopordon* and *Silybum*) and casually on other Asteraceae (BLACKMAN & EASTOP, 2006). It is widely distributed in Europe and also in Turkey, Armenia, Kazakhstan and Siberia (HOLMAN, 2009).

LIST OF APHID HOST-PLANTS

According to the list of the host-plants and their aphids by LAAMARI *et al.* (2010; 2011) and LAAMARI and COEUR D'ACIER (2010), 28 host-plant aphid relationships (marked with + in the list) are new for Algeria and, according to both BLACKMAN & EASTOP (2006, 2010) and HOLMAN (2009), two host-plant aphid relationships (marked with * in the list) are new in polyphagous species for the world. The species are listed in alphabetical order.

***Acyrtosiphon malvae* (Mosely, 1841)**

[Aphidinae: Macrosiphini]

+*Malva neglecta*: Ain Fezza (1.vi.2010).Recorded from Algeria by LAAMARI *et al.* (2010).***Acyrtosiphon pisum* (Harris, 1776)**

[Aphidinae: Macrosiphini]

Vicia faba: Ain Fezza (17.v.2009).Recorded from Algeria by LAAMARI *et al.* (2010).***Aphis fabae* Scopoli, 1763**

[Aphidinae: Aphidini: Aphidina]

+*Cestrum diurnum* (Solanaceae): Tlemcen (22.vi.2010); +*Cynara scolymus*: Tlemcen (8.vi.2009); +*Galactites tomentosa*: Ain Fezza (1.vi.2010), Béni Boulène (12.v.2009); +*Lamium purpureum*: Ain Fezza (17.v.2009); +*Malus domestica*: Ghazaouet (25.v.2009); +*Phaseolus vulgaris*: Sebdo (22.vi.2010); +*Pittosporum tobira*: Ain Fezza (28.v.2009); +*Punica granatum*: Oued Chouli (7.vi.2009); +*Rosa* sp.: Béni Snouss (1.vi.2009); +*Sinapis arvensis*: Oued Chouli (7.vi.2009); +*Thapsia villosa*: Ain Fezza (17.v.2009, 1.vi.2010), Béni Boulène (12.v.2009), Rechgoune (30.vi.2010); +*Urtica dioica*: Sebdo (22.vi.2010); *Vicia faba*: Ain Fezza (17.v.2009);

Unidentified plant: El Amria (27.iii.2009).

Recorded from Algeria by HOLMAN (2009).

***Aphis gossypii* Glover, 1877**

[Aphidinae: Aphidini: Aphidina]

+*Bryonia dioica*: Béni Snouss (1.v.2009); +*Citrus aurantium*: El Fhoul (19.v.2009); +*Citrus limon*: El Fhoul (19.v.2009); +*Lamium purpureum*: Ain Fezza (17.v.2009).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Aphis billerislambersi* Nieto Nafria & Mier Durante, 1976**

[Aphidinae: Aphidini: Aphidina]

Euphorbia sp.: Béni Boulène (12.v.2009).
First record from Northern Africa.

***Aphis illinoisensis* Shimer, 1866**

[Aphidinae: Aphidini: Aphidina]

Vitis vinifera: El Amria (24.v.2009).
Recorded from Algeria by LAAMARI & COEUR D'ACIER (2010).

***Aphis nerii* Boyer de Fonscolombe, 1841**

[Aphidinae: Aphidini: Aphidina]

Nerium oleander: Béni Snouss (1.vi.2009); Tlemcen (8.vi.2010).
Recorded from Algeria by REMAUDIÈRE (1954).

***Aphis punicae* Passerini, 1863**

[Aphidinae: Aphidini: Aphidina]

Punica granatum: Oued Chouli (7.vi.2009).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Aphis spiraecola* Patch, 1914**

[Aphidinae: Aphidini: Aphidina]

+*Citrus aurantium* El Fhoul (19.v.2009); +*Citrus limon*: El Fhoul (19.v.2009); Rechgoune (30.vi.2010).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Brachycaudus amygdalinus* (Schouteden, 1905)**

[Aphidinae: Macrosiphini]

Prunus sp.: Oued Chouli (7.vii.2009).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Brachycaudus cardui* (Linnaeus, 1758)**

[Aphidinae: Macrosiphini]

+*Cynara scolymus*: Sidi Said (9.vi.2009), Oulhasa (30.vi.2010); +*Galactites tomentosa*: Ain Fezza (17.v.2009), Béni Boulène (12.v.2009); Unidentified plant: Ain Fezza (17.v.2009); Béni Boulène (12.v.2009); Qued Chouli (7.v.2009).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Brachycaudus helichrysi* (Kaltenbach, 1843)**

[Aphidinae: Macrosiphini]

+*Prunus persica*: Ain Fezza (25.v.2009); +*Punica granatum*: Oued Chouli (7.vi.2009); Unidentified plant: Béni Boulène (12.v.2009).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Brevicoryne brassicae* (Linnaeus, 1758)**

[Aphidinae: Macrosiphini]

Sinapis arvensis: Oued Chouli (7.vi.2009); Brassicaceae: Ain Fezza (17.5.2009).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Dysaphis plantaginea* (Passerini, 1860)**

[Aphidinae: Macrosiphini]

Malus communis: Sebdu (22.vi.2010).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Hyalopterus amygdali* (E. Blanchard, 1840)**

[Aphidinae: Aphidini: Rhopalosiphina]

Prunus dulcis: Ain Youcef (19.v.2009).
First record from Algeria.

***Hyalopterus persikonus* Miller, Lozier & Footitt, 2008**

[Aphidinae: Aphidini: Rhopalosiphina]

Prunus persica: Ain Fezza (25.v.2009).
First record from Northern Africa.

***Hyalopterus* sp.**

[Aphidinae: Aphidini: Rhopalosiphina]

**Phragmites australis*: Oulhasa (30.vi.2010).
The identification of the species of the genus *Hyalopterus* on this secondary host is impossible basing on the current taxonomic and molecular knowledge (LOZIER *et al.*, 2008).

***Hyperomyzus lactucae* (Linnaeus, 1758)**

[Aphidinae: Macrosiphini]

**Sonchus arvensis*: Ain Fezza (1.vi.2010); Sebdu (22.vi.2010); Unidentified plant: Béni Boulène (12.v.2009).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Macrosiphum euphorbiae* (Thomas, 1878)**

[Aphidinae: Macrosiphini]

**Galactites tomentosa*: Béni Boulène (12.v.2009).
Recorded from Algeria by LAAMARI *et al.* (2010).

***Melanaphis donacis* (Passerini, 1862)** [Aphidinae:

Aphidini: Rhopalosiphina]

Phragmites australis: Nedroma (17.5.2009); Sidi Said (8.vi.2009).
First record from Algeria.

***Myzus persicae* (Sulzer, 1776)**

[Aphidinae: Macrosiphini]

**Citrus aurantii*: El Fhoul (19.v.2009); *Prunus dulcis*: Ain Youcef (19.v.2009); *Prunus persica*: Ain Youcef (19.v.2009); **Thapsia villosa*: Ain Fezza (17.v.2009).
Recorded from Algeria by REMAUDIÈRE (1954).

***Pterochloroides persicae* (Cholodkovsky, 1899)**

[Lachninae: Lachnini]

Prunus dulcis: Honaine (9.vi.2009).
Recorded from Algeria by BENIA and BOUNECHADA (2011).

***Uroleucon aeneum* (Hille Ris Lambers, 1939)**

[Aphidinae: Macrosiphini]

Galactites tomentosa: Ain Fezza (17.v.2009, 1.vi.2010); Unidentified plant: El Fhoul (25.v.2010).
First record for Northern Africa.

***Uroleucon sonchi* (Linnaeus, 1767)**

[Aphidinae: Macrosiphini]

**Sonchus arvensis*: Ain Fezza (1.vi.2010); Sebdu (22.vi.2010).
Recorded from Algeria by LAAMARI *et al.* (2010).

CONCLUSION

Basing on the biodiversity of plants in Algeria (3139 plant species according to CHENOUF, 2009) and in the rest of the countries of the north of Africa (Morocco, Tunisia, Libya, Egypt) it is assumable that the number of aphid species overcomes widely the 300 records nowadays known from the Maghreb. This number is still very far from the 550 species already identified from the French Mediterranean region (LECLANT, 1978) and from the 436 species recorded from Sicily (BARBAGALLO *et al.*, 2009).

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