### SHORT COMMUNICATION

# First record of *Aphis craccivora* Koch (Hemiptera: Aphididae) on aronia crop in Montenegro

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**Summary** The aphid *Aphis craccivora* was recorded on the crop of aronia, *Aronia melanocarpa*, in Montenegro, in June 2015 and 2016. This is the first record of *A. craccivora* in Montenegro on aronia.

Additional keywords: aphid, Aphis craccivora, Aronia melanocarpa, southeastern Europe

In recent years aronia, Aronia melanocarpa (Michx.) Elliott (Rosales: Rosaceae), has become a quite popular fruit crop in Montenegro. It is a woody perennial shrub, resistant to cold and can be successfully grown in conditions of severe continental climate (Nikolić and Milivojević, 2010), which dominates in the northern part of Montenegro. It is currently considered as a profitable crop due to a relatively high price of the fruit (black chokeberries) and its other uses, including processed products (i.e., syrup, juice, soft spreads, tea, food colors) (McKay, 2001) and as an ornamental plant (Yovkova et al., 2013). For all these reasons and the fact that it is attacked by a small number of pests and diseases, aronia has earned a profound place in the organic production in Montenegro, where among the total number of 203 registered organic producers, 20 of them grow aronia berries at a surface area of approximately 10 ha.

In June 2015, at the locality of Bojna Njiva, Municipality of Mojkovac, aphids were observed to infest an aronia plantation at altitudes between 1063 m and 1077 m. They were spotted on two plants among a total of 1600 bushes. One year later, in June 2016, the presence of aphids was recorded on numerous bushes of aronia among a total of 3000 plants at the locality Stevanovac of the same Municipality at altitudes between 875 m and 905 m. Samples of aphids were collected in 2016 and were identified as Aphis craccivora Koch (Hemiptera: Aphididae). To our knowlegde, this is the first record of A. craccivora infesting aronia in Montenegro. Aphids have been previously reported as pests of aronia (infestation of shoot tips) but the consequent slow down effect on the plant growth is not considered serious because the plants are vigorous (McKay, 2001). Recently, Aphis spiraecola Patch (Hemiptera: Aphididae) and Aulacorthum circumflexum (Buckton) (Hemiptera: Aphididae) were identified as pests of A. melanocarpa from southeastern Europe (Bulgaria) (Yovkova et al., 2013).

Aphis craccivora is a relatively small species. The apterous viviparous female individuals have a shiny black or dark brown body with a prominent cauda and brown to yellow legs. The immatures are slightly dusted with wax while adults appear without wax. The antennae have six segments. The distal part of femur, siphunculi and cauda are black. The length of apterae individuals ranges between 1.4 and 2.2 mm. The alate viviparous A. craccivora females have abdo-

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men with dorsal cross bars. The length of alatae ranges between 1.4 and 2.1 mm (Blackman and Eastop, 2000).

Aphis craccivora is associated with about 50 crops and weed species belonging to 19 plant families (i.e., Amaranthaceae, Araceae, Asteraceae, Brassicaceae, Caryophyllaceae, Chenopodiaceae, Cucurbitaceae, Fabaceae, Malpighiaceae, Malvaceae, Nyctaginaceae, Pedaliaceae, Portulacaceae, Ranunculaceae, Rosaceae, Rutaceae, Solanaceae, Sterculiaceae, Zingiberaceae) from which the aphid mainly attacks Fabaceae (Blackman and Eastop, 2007; Kavallieratos et al., 2007; Mehrparvar et al., 2012; Yovkova et al., 2013; CABI data base, 2016). The species is probably palearctic warm temperate in origin but it has now a cosmopolitan distribution; it is abundant in subtropical and tropical regions, and in the Mediterranean. It is one of the commonest aphid species with a high pest status in the tropics (Blackman and Eastop, 2000).

Aphis craccivora is generally anholocyclic (wingless and winged females), ovoviviparous. In the tropics the aphid reproduces parthenogenetically throughout the year while in areas with colder winters, overwintering may be as egg or hibernation. In Europe, males (alate) and sexual forms have been recorded in Germany (Falk, 1960). Temperatures that range between 24 and 28.5°C and 65% relative humidity (= RH) are optimal conditions for the development of A. craccivora (Réal, 1955; Mayeux, 1984), which is capable of rapid population development. Formation of winged individuals is triggered by the reduction in the intensity of hydrocarbon translocation (Mayeux, 1984). Young colonies concentrate on growing points of plants and are regularly attended by ants (mutualism with ants) (Soans and Soans, 1971; Hamid et al., 1977; Takeda et al., 1982; Patro and Behera, 1991).

The spectrum of natural enemies that are associated with *A. craccivora* is wide. For instance, Kavallieratos *et al.* (2004, 2016) reported 13 parasitoid species (Hymenoptera: Braconidae: Aphidiinae) that parasitize this aphid in agricultural and non-agricultural ecosystems in southeastern Europe, i.e., Aphidius colemani Viereck, Aphidius matricariae Haliday, Binodoxys acalephae (Marshall), Binodoxys angelicae (Haliday), Diaeretiella rapae (M'Intosh), Ephedrus pericae Froggat, Lipolexis gracilis Förster, Lysiphlebus confusus Tremblay and Eady, Lysiphlebus fabarum (Marshall), Lysiphlebus orientalis Starý and Rakhshani, Lysiphlebus testaceipes (Cresson), Praon abjectum (Haliday), Praon volucre (Haliday). Important predators include coccinellid beetles [Cheilomenes sexmaculata (F.), Coccinella septempunctata (L.) (Coleoptera: Coccinelidae)], syrphid larvae [Ischiodon scutellaris (F.) (Diptera: Syrphidae)] Neuroptera larvae [Micromus timidus Hagen (Neuroptera: Hemerobiidae)] and Diptera larvae [Aphidoletes aphidimyza (Rondani) (Diptera: Cecidomyidae)]. Spiders may also be important in some areas (CABI data base, 2016). Recorded fungal pathogens include Fusarium pallidoroseum (Cooke) Sacc. (Hypocreales: Nectriaceae) (Hareendranath et al., 1987) and Neozygites fresenii (Nowak.) Remaud. and S. Keller (Entomophthorales: Neozygitaceae) (Zhang, 1987; Sewify, 2000).

Most of the major chemical groups of insecticides have been used against this aphid species, including organophosphates, carbamates and pyrethroids (CABI data base, 2016). However, decisions concerning the chemical treatment against *A. craccivora* should take into account the identity and abundance of local populations of its natural enemies in the context of an integrated pest management, so as to avoid outbreaks of this important pest.

#### Literature cited

- Blackman, R.L. and Eastop, V.F. 2000. Aphids on the World's Crops. An Identification and Information Guide. Second Edition. The Natural History Museum, London, 466 pp.
- Blackman, R.L. and Eastop, V.F. 2007. Taxonomic Issues. In: van Emden H.F. and R. Harrington (eds.). *Aphids as Crop Pests*. Wallingford, Oxfordshire, pp 1-30.
- CABI data base. 2016. http://www.cabi.org/isc/ datasheet/6192.
- Falk, U. 1960. Fber das Auftreten von IntermediSrformen zwischen oviparem und geflügeltem

viviparem Weibchen bei *Aphis craccivora* Koch. *Zoologischer Anzeiger*, 165: 388-392.

- Hamid, S., Sha, M.A. and Anwar, M.A. 1977. Some ecological and behavioural studies on *Aphis craccivora* Koch (Hemi.: Aphididae). *Technical Bulletin, Commonwealth Institute of Biological Control*, 18: 99-111.
- Hareendranath, V., Nair, K.P.V. and Paulos, S. 1987. *Fusarium pallidoroseum* (Cooke) Sacc. as a fungal pathogen of *Aphis craccivora* Koch. *Entomon*, 12: 392-394.
- Kavallieratos, N.G., Tomanović, Ž, Starý, P., Athanassiou, C.G., Sarlis, G.P., Petrović, O., Niketić, M. and Anagnou-Veroniki, M. 2004. A survey of aphid parasitoids (Hymenoptera: Braconidae: Aphidiinae) of southeastern Europe and their aphid - plant associations. *Applied Entomology* and Zoology, 39: 527-563.
- Kavallieratos, N.G., Tomanović, Ž., Sarlis, G.P, Vayias, B.J., Žikić, V. and Emmanouel, N.E. 2007. Aphids (Hemiptera: Aphidoidea) on cultivated and selfsown plants in Greece. *Biologia*, 62: 335-344.
- Kavallieratos, N.G., Tomanović, Ž., Petrović, A., Kocić, K., Janković, M. and Starý, P. 2016. Parasitoids (Hymenoptera: Braconidae: Aphidiinae) of aphids feeding on ornamental trees in southeastern Europe: key for identification and tritrophic associations. Annals of the Entomological Society of America, 109: 473-487.
- Mayeux, A. 1984. The groundnut aphid. *Biology and control. Oleagineux*, 39: 425-434.
- McKay, S.A. 2001. Demand increasing for aronia and elderberry in North America. *New York Fruit Quarterly*, 9: 2-3.
- Mehrpavar, M., Madjdzadeh, S.M., Mahdavi Arab, N., Esmaeilbeygi, M. and Ebrahimbour, E. 2012. Morphometric discrimination of black legume aphid, *Aphis craccivora* Koch (Hemiptera: Aphididae), populations associated with differ-

ent host plants. North-Western Journal of Zoology, 8(1): 172-180.

- Nikolić, M.D. and Milivojević, J.M. 2010. Jagodaste voćke - Tehnologoja gajenja. Naučno voćarsko društvo Srbije, Čačak.
- Patro, B. and Behera, M.K. 1991. Mutualism between the bean aphids (*Aphis craccivora* Koch) and ants. *Orissa Journal of Agricultural Research*, 4: 238.
- Réal, P. 1955. Le cycle annuel du puceron de l'arachide (Aphis leguminosae Theob.) en Afrique noire française et son déterminisme. Revue de Pathologie Végétale et d'Entomologie agricole de France, 34(1-2): 1-122.
- Sewify, G.H. 2000. *Neozygites fresenii* causing epizootic in aphids (*Aphis craccivora* Koch.) population on faba bean in Egypt. *Bulletin of Faculty of Agriculture, University of Cairo,* 51: 85-94.
- Soans, A.B. and Soans, J.S. 1971. Proximity of the colonies of the tending ant species as a factor determining the occurrence of aphids. *Journal of the Bombay Natural History Society*, 68: 850-851.
- Takeda, S., Kinomura, K. and Sakurai, H. 1982. Effects of ant-attendance on the honeydew excretion and larviposition of the cowpea aphid, *Aphis craccivora* Koch. *Applied Entomology and Zoology*, 17: 133-135.
- Yovkova, M., Petrović-Obradović, O., Tasheva-Terzieva, E. and Pencheva, A. 2013. Aphids (Hemiptera, Aphididae) on ornamental plants in greenhouses in Bulgaria. *ZooKeys*, 319: 347–361.
- Zhang, X.L. 1987. Processes of infection and pathogenesis of *Entomophthora fresenii* on aphids. *Chinese Journal of Biological Control*, 3: 121-123.

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#### ΣΥΝΤΟΜΗ ΑΝΑΚΟΙΝΩΣΗ

## Πρώτη καταγραφή της αφίδας *Aphis craccivora* Koch (Hemiptera: Aphididae) σε καλλιέργεια αρωνίας στο Μαυροβούνιο

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**Περίληψη** Η αφίδα Aphis craccivora καταγράφηκε να προσβάλλει την καλλιέργεια της αρωνίας, Aronia melanocarpa, στο Μαυροβούνιο, τον Ιούνιο των ετών 2015 και 2016. Πρόκειται για την πρώτη καταγραφή του A. craccivora επί του A. melanocarpa στο Μαυροβούνιο.

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