



The rapid spread of *Corythucha arcuata* in Southeastern Europe

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Country of origin and closely related species

- Eastern and middle part of USA, southern Canada
- **70+** species described within the *Corythucha* genus
- Morphologically and biologically similar, oligophagous-polyphagous, leaf suckers on large number of North American deciduous woody species (*Corythucha juglandis*, *C. salicis*, *C. coryli*, *C. crataegi*, *C. pruni*, *C. padi*, *C. aesculi*, *C. constricta*, *C. bulbosa*, *C. fuscigera*, *C. ciliata*)

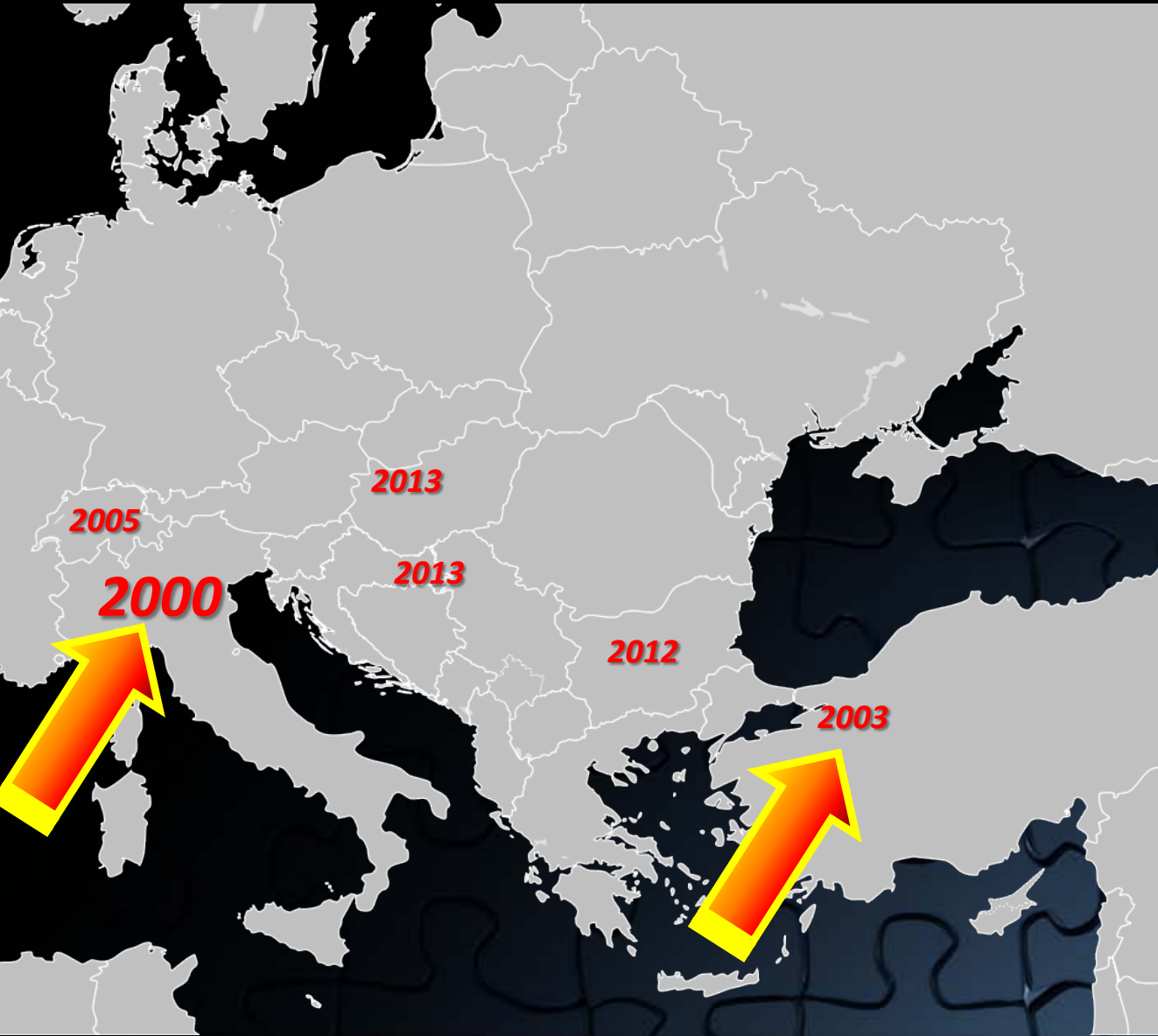


Host plants and impact levels in USA

- *Quercus muehlenbergii*
- *Q. alba*
- *Q. macrocarpa*
- *Q. Prinoides*
- *Q. prinus*
- *Q. rubra*
- and occasionally on representatives of the genera:
 - *Castanea, Acer, Pyrus, Malus* and *Rosa*
- Harmful efect variable



Arrival and spread throughout Europe



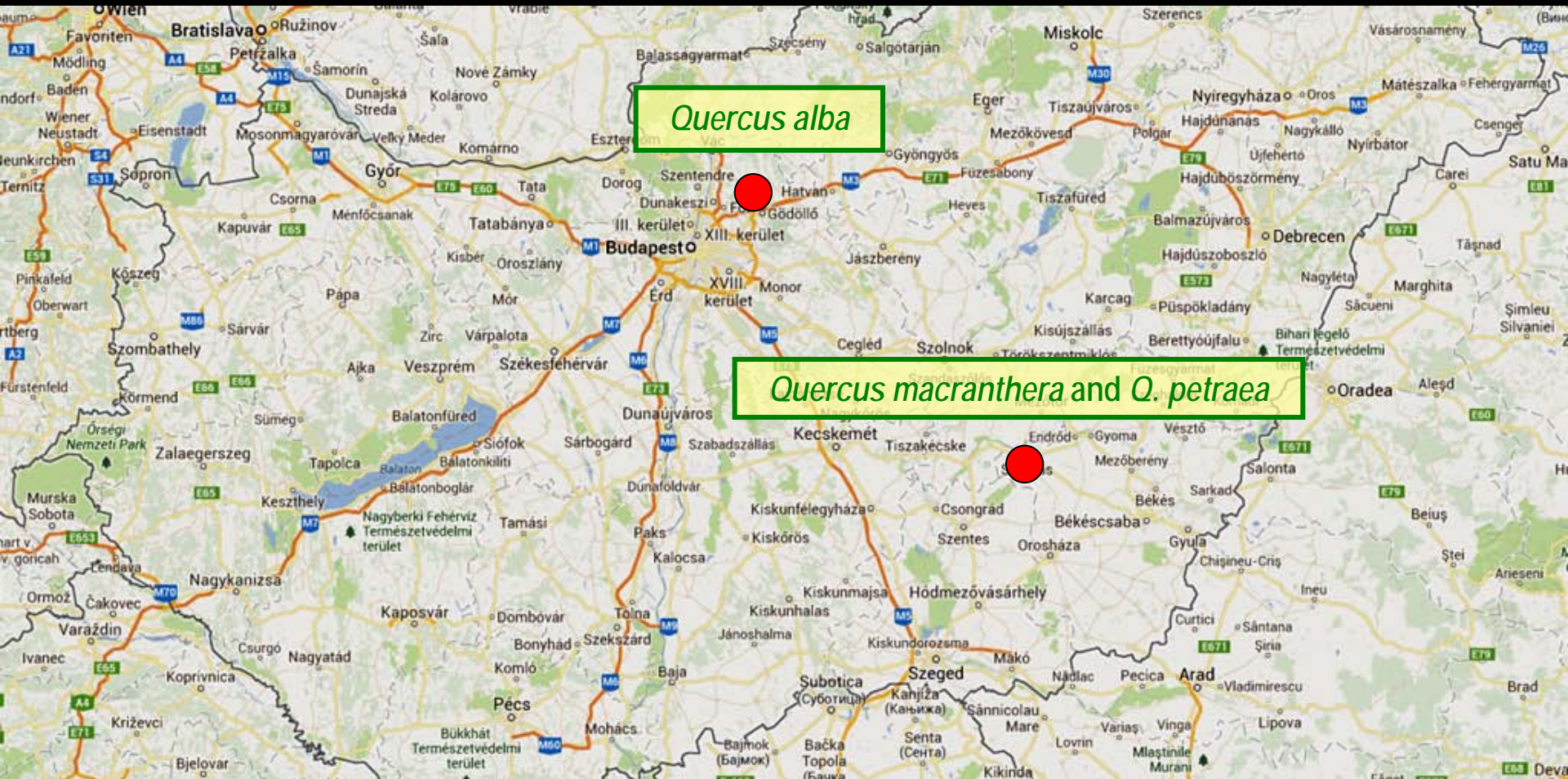
Scientific publications – crude reflection of “newcomer disturbance impact”

- 2000** - Bernardinelli, I., P. Zandigiacomo, 2000: Prima segnalazione di *Corythucha arcuata* (Say) in Italia.
- 2000 - Bernardinelli, I. 2000. Distribution of the oak lace bug, *Corythucha arcuata* (Say) in Italy.
- 2001 - Bernardinelli, I. 2001. GIS representation of *Corythucha arcuata* (Say) distribution in Italy.
- 2003** - Mutun, S., 2003: First report of the oak lace bug, *Corythucha arcuata* (Say, 1832) in Turkey.
- 2005** - Forster, B., I. Giacalone, M. Moretti, P. Dioli, B. Wermelinger, 2005: Die Amerika-Eiche (Quercus robur L.) in der Schweiz.
- 2006 - Bernardinelli, I. 2006. Potential host plants of *Corythucha arcuata* (Het., Tingidae) in Italy.
- 2007 - Dioli, P., I. G. Forini, M. Moretti, M. Salvetti, 2007: Note sulla distribuzione di *Corythucha arcuata* (Say) in Italia.
- 2008 - Daisie, 2008: European Invasive Alien Species Gateway (<http://www.europe-alien-species-gateway.org/>)
- 2008 - Rabitsch, W., 2008: Alien True Bugs of Europe (Insecta: Hemiptera: Heteroptera).
- 2009 - Kenis, M., M.-A. Auger-Rozenberg, A. Roques, L. Timms, C. Péré, M. J. W. Cock, J. B. Whitfield, 2009: The European Catalogue of Invasive Alien Species (ECIAS).
- 2009** - Mutun, S., Z. Ceyhan, C. Sözen, 2009: Invasion by the oak lace bug, *Corythucha arcuata* (Say) in Turkey.
- 2009 - Nentwig, W., M. Josefsson, 2009: Introduction. Chapter 1. Alien terrestrial arthropods.
- 2010 - Rabitsch, W., 2010: True Bugs (Hemiptera, Heteroptera). Chapter 9.1. – In: Roques, A., M. Kenis, D. Lees, C. Lopez-Vaamonde, W. Rabitsch, J. Rasplus, D. Soligo, 2010: The European Catalogue of Invasive Alien Species (ECIAS).
- 2010 - Roques, A., 2008: The pan-European inventory of alien species established on trees.
- 2010 - Roques, A., M. Kenis, D. Lees, C. Lopez-Vaamonde, W. Rabitsch, J. Rasplus, D. Soligo, 2010: The European Catalogue of Invasive Alien Species (ECIAS).
- 2013** - Dobрева, M., N. Simov, G. Georgiev, P. Mirchev, M. Georgieva, 2013: First Record of the Oak Lace Bug (*Corythucha arcuata*) in Bulgaria.
- 2013** - Csóka, G., A. Hirka, M. Somlyai, 2013: A tölgy csipkés poloska (*Corythucha arcuata*) Magyarországon.
- 2013** – Hrašovec, B., Posarić, D., Lukić, I. Pernek, M., 2013: First record of oak lace bug (*Corythucha arcuata*) in Croatia.



First record locations in Hungary

- Very localized, in terms of area infested, but easily observable infestation symptoms in **two arboreta** near Budapest in summer 2013
- Host plants: two exotic oak species (*Quercus alba*, *Q. macranthera*) and one indigenous common oak species - sessile oak (*Q. petraea*)



First record locations in Hungary

- Heavy infestation on *Quercus macranthera* leaves



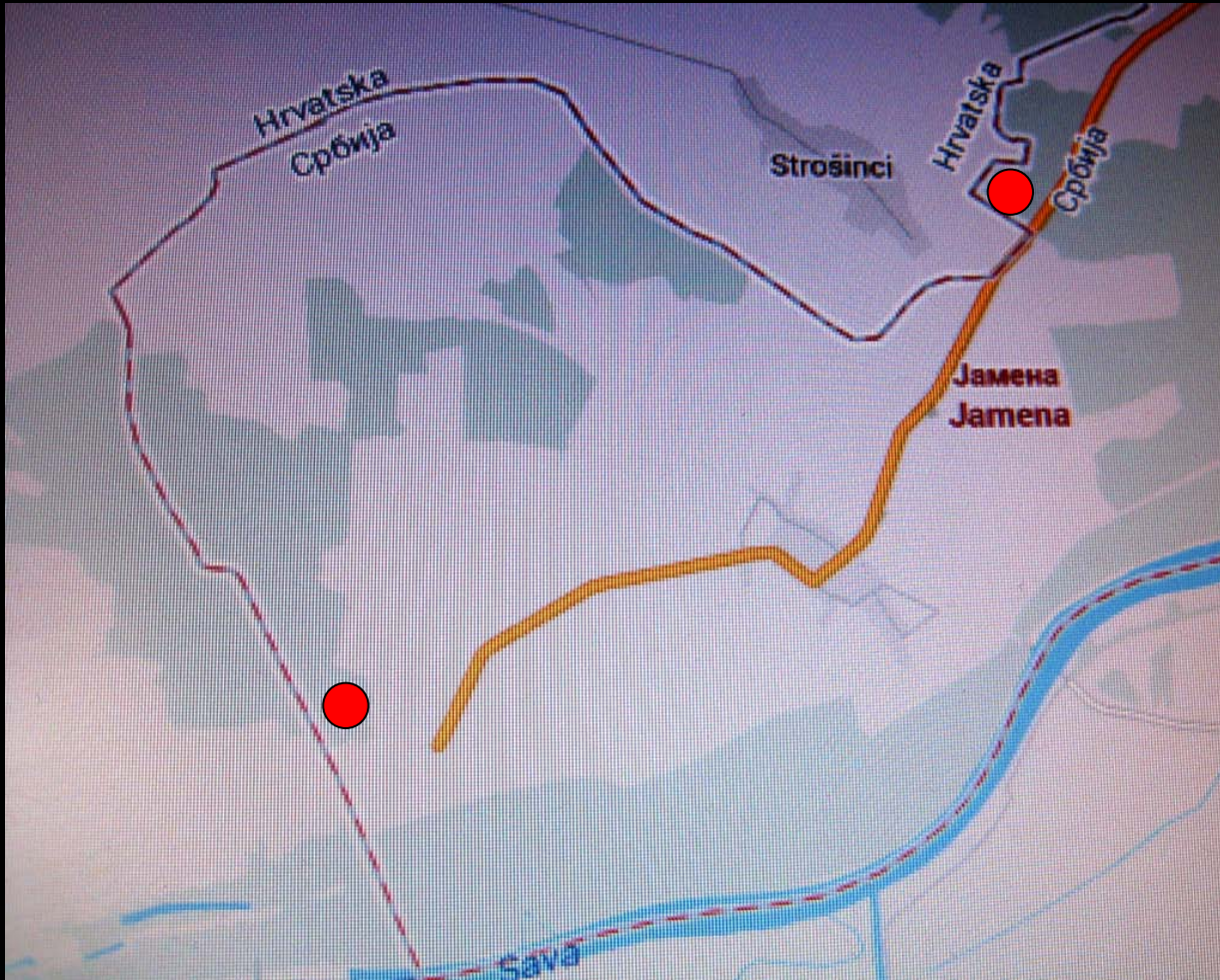
First record locations in Croatia

- Some strange “dotty yellowing symptoms” in summer 2013
- Field checkup in October confirms *C. arcuata*



First record locations in Serbia

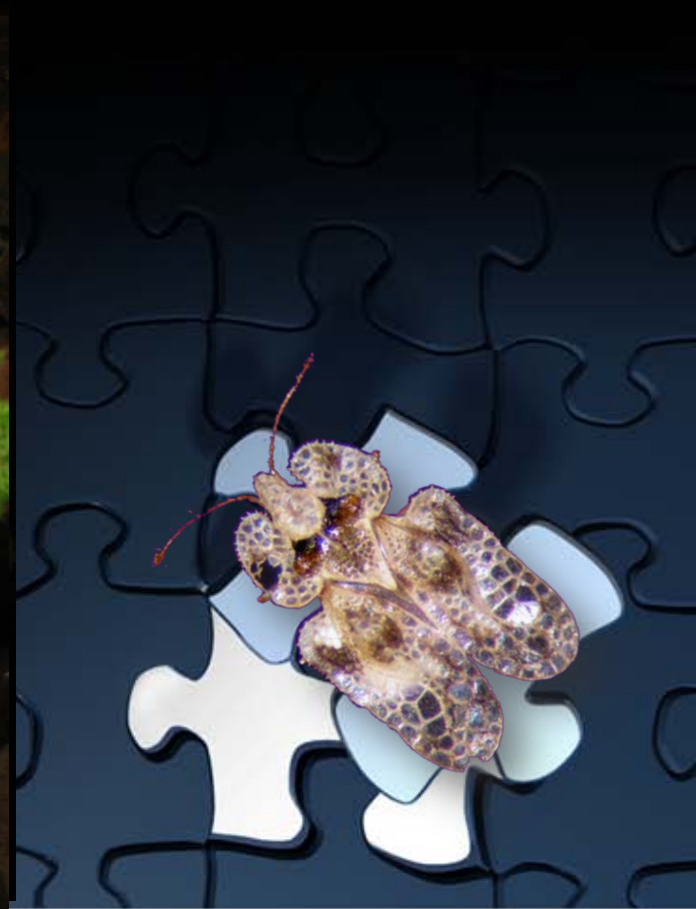
- Locality 1 - 44° 9118' N; 19° 0874' E
- Locality 2 - 44° 8730' N; 19° 0169' E



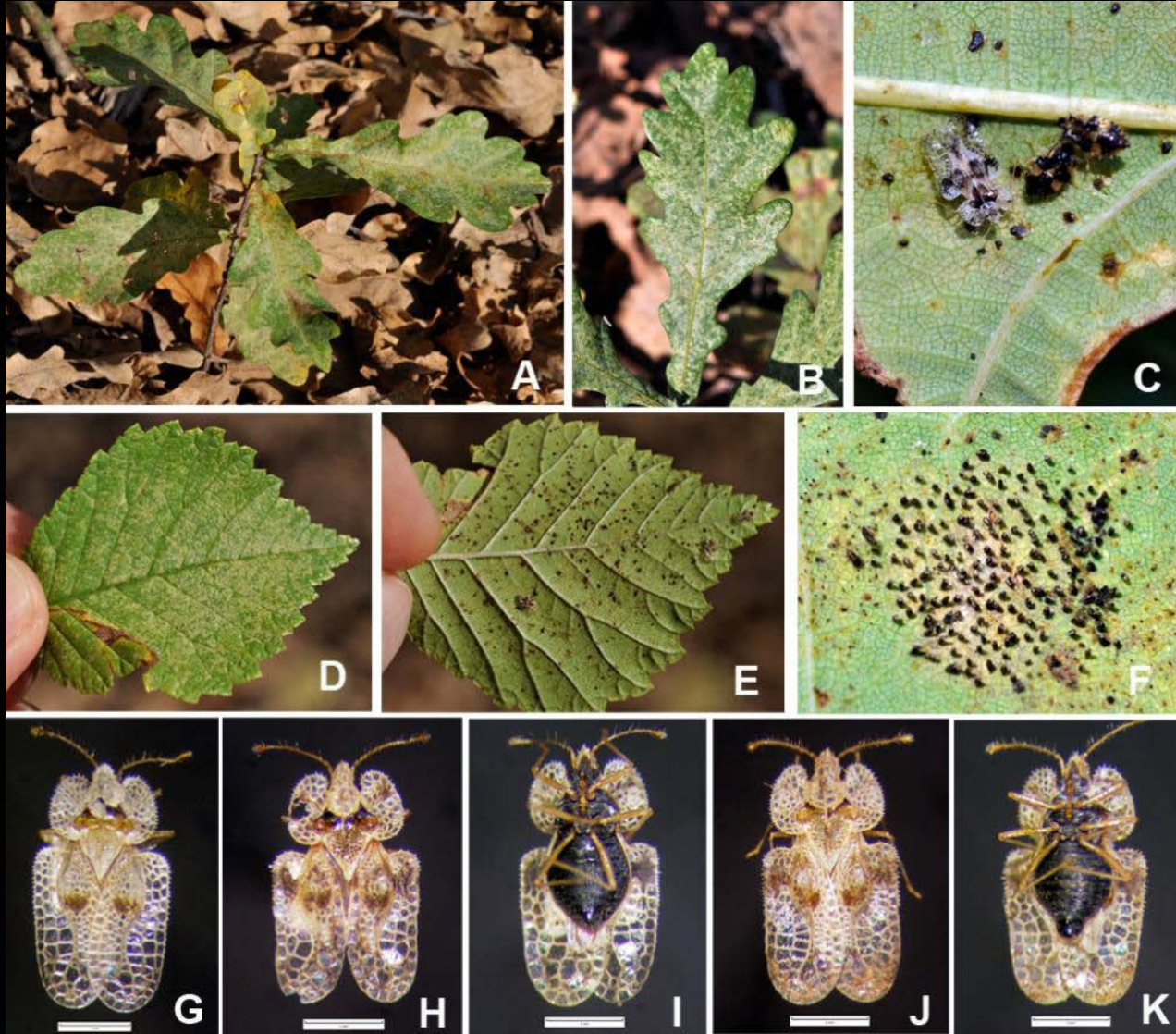
First record locations in Serbia

Host plants:

Quercus robur, *Quercus cerris*



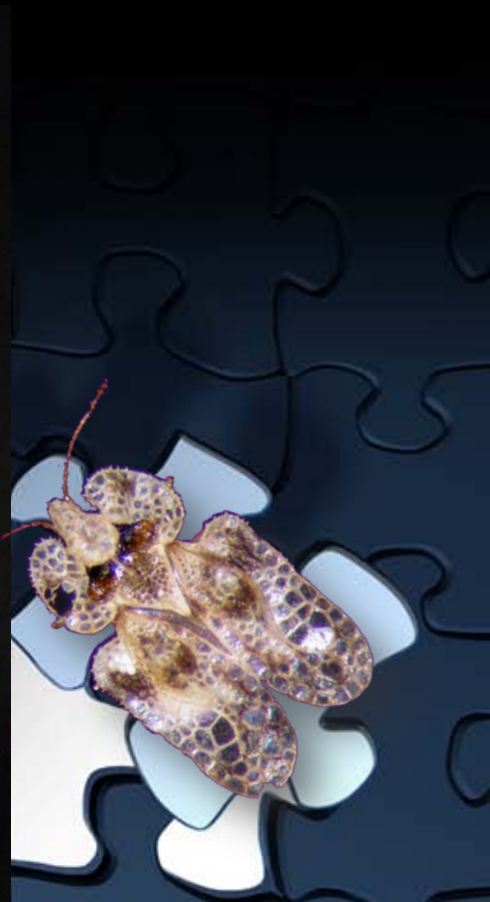
Attack symptoms, biology, developmental stages



Morphological similarities and distinguishing features between the two newcomers

Corythucha arcuata

Corythucha ciliata



Sycamore versus oak lace bug

Biological and symptomatological similarities



Sycamore versus oak lace bug

Biological and symptomatological similarities – number of generations



Sycamore versus oak lace bug

Biological and symptomatological similarities – overwintering sites,
winter survival rates, predator spectrum and efficacy, parasitoids ???



European hosts recorded so far

- On the deciduous European oaks (*Q. robur*, *Quercus pubescens* Willd, *Quercus petraea* (Mattuschka) Liebl., *Quercus cerris* L.), as well as *Rubus ulmifolius* Schott. and *Rubus idaeus* L., most of the lace bugs (>50%) reached the adult stage; on *Castanea sativa* Mill., *Rubus caesius* L. and *Rosa canina* L., a reduced number of individuals (<25%) reached the adult stage. No nymphs survived on *Quercus rubra* L. (mentioned in literature as a host plant), on the evergreen oaks *Quercus suber* L. and *Quercus ilex* L., on *Malus domestica* Borkh. and four tested maple species. On plant species where the lace bug reached the adult stage, the development time varied from 13 to 27 days. On European deciduous oak species, the development time was longer on leaves taken in late summer (September) than on those of late spring (June); on the contrary, such differences were not observed on *Rubus* species, and *Castanea sativa* Bernardinelli 2006)

- *Quercus petraea*
 - *Quercus robur*
 - *Quercus pubescens*
 - *Quercus virgiliana*
 - (on *Crataegus* spp adults only)
 - *Quercus cerris*
 - *Quercus rubra*
 - *Rubus idaeus*
 - *Rubus ulmifolius*
 - *Castanea sativa*
 - *Rosa canina*
- (Bernardinelli & Zandigiacomo 2000, Forster et al. 2005, Dioli et al. 2007, Mutun et al. 2008, Dobrevva 2013)

- *Quercus robur*
- *Ulmus minor*
- *Malus sylvestris*
- *Rubus* sp.

(Hrašovec et al. 2013)

What are we to expect ?

- Change in host spectrum due to habitat differences in Southern Europe ?
- Change in damaging levels due to climatic differences ?
- The role of indigenous predators and parasitoids ?
- Interaction with other sapsucking feeders, cumulative negative effect ?
- Disturbance in rejuvenation of oak stands ?
- Other ????

