



**HAL**  
open science

## From the east to the west: rapid range expansion of the lime leaf miner in Eurasia

Natalia Kirichenko, Paolo Triberti, Sylvie Augustin, Alain Roques, Carlos Lopez-Vaamonde

► **To cite this version:**

Natalia Kirichenko, Paolo Triberti, Sylvie Augustin, Alain Roques, Carlos Lopez-Vaamonde. From the east to the west: rapid range expansion of the lime leaf miner in Eurasia. Insect invasions in a changing world, Le Studium - Loire Valley Institute for Advanced Studies. FRA., Dec 2014, Orléans, France. 1p. hal-02795737

**HAL Id: hal-02795737**

**<https://hal.inrae.fr/hal-02795737>**

Submitted on 5 Jun 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



### Dr Natalia Kirichenko

V.N. Sukachev Institute of Forest SB RAS - Siberian Federal University - Akademgorodok 50/28, Krasnoyarsk, 660036, Russia;  
INRA, UR0633 Zoologie Forestière,  
2163 Avenue de la Pomme de Pin, CS 40001, Ardon, 45075 Orléans Cedex 2, France

Tel.: +7 905 9971294  
Email: [nkirichenko@yahoo.com](mailto:nkirichenko@yahoo.com)

*I am a forest entomologist from the V.N. Sukachev Institute of Forest, Siberian branch of the Russian Academy of Sciences, where I have been working since 1997. My interests concern the ecology, molecular genetics, molecular systematics, and risk assessment of invasive forest insect pests. Recently I have participated in research programs to detect potentially harmful herbivorous pests and to study colonization of native and exotic plants by phyllophagous insects in Asian and European botanical gardens in order to test various hypotheses linked to biological invasions. I am particularly interested in colonization and invasion history of leaf mining insects on woody plants. I have taken part in different national and international projects, including EU-funded projects and carried research on invasive insect pests in different international laboratories: GAU (Germany), LUBIES, ULB (Belgium), CABI-Europe (Switzerland), INRA (France).*

### From the east to the west: rapid range expansion of the lime leaf miner in Eurasia

**Natalia Kirichenko<sup>1,2,3</sup>, Paolo Triberti<sup>4</sup>, Sylvie Augustin<sup>3</sup>, Alain Roques<sup>3</sup>, Carlos Lopez-Vaamonde<sup>3</sup>**

<sup>1</sup>V.N. Sukachev Institute of Forest SB RAS, Krasnoyarsk, Russia

<sup>2</sup>Siberian Federal University, Krasnoyarsk, Russia

<sup>3</sup>INRA Institut National de la Recherche Agronomique, URZF, Orléans, France

<sup>4</sup>Museo Civico di Storia Naturale, Verona, Italy

In the last decades, the number of insect introductions has increased in Europe dramatically. Remarkably, most of these invasive pests originate from Asia and arrive to Europe either with the trade of ornamental plants, or as stowaways inadvertently transported with imports of goods from Asia or on their own following an expansion of their geographic range. Some of those Asian invasive insects provide extraordinary examples of rapid expansion and represent good models to address interesting questions about the evolutionary changes underlying invasions. Which are the underlying genetic changes associated with successful invasions? Are invasions driven by high performance genotypes?

Here we target those questions by studying the genetic structure of the lime leaf miner *Phyllonorycter issikii* (Lepidoptera: Gracillariidae). This tiny micromoth originating from Eastern Asia in the last few decades has spread westwards at a rate of more than 90 km per year over the whole of Russia and invaded numbers of eastern European countries, becoming a serious ornamental pest of lime trees *Tilia* (Malvaceae). Our analyses of mitochondrial data revealed an unexpectedly high genetic diversity in the invaded regions. We also identified some particular haplotypes that are prevalent in the invaded regions and native area. By combining morphological and genetic data we discovered a putative new species of *Phyllonorycter* feeding on *Tilia*, which co-occurs with its closely related *P. issikii* in some localized areas in the native region. This new species does not show yet any evidence of expansion of its distribution range. These results highlight the importance of studying the phylogeography and systematics of invasive insects to fully understand their evolutionary ecology.

This research is supported by LE STUDIUM® Loire Valley Institute for Advanced Studies (France).