Asian botanical gardens as a part of early warning system of new pest risks

Natalia Kirichenko¹, Maria Tomoshevich², Yuri Baranchikov¹, Marc Kenis³

¹ V.N. Sukachev Institute of Forest SB RAS
² Central Siberian botanical garden SB RAS, Novosibirsk, Russia
³ CABI Europe-Switzerland, Delémont, Switzerland

nkirichenko@yahoo.com

Abstract
Botanical gardens can play an important role in early detection of new insect pests and pathogenic fungi posing a threat to woody plants. Asia is known as one of the main sources of forest insect pests and disease agents for Europe. Thus European plants growing in the Asian botanical gardens can serve as sentinel tools for identifying potential threats for Europe.

In 2008-2015, we surveyed the largest botanical gardens and arboreta in Asian Russia (in Novosibirsk, Tomsk, Krasnoyarsk, Irkutsk, Vladivostok and Gornotayejnoe village in Primorskiy krai) to identify poorly known pests and diseases that, if introduced westward, may represent a danger for native woody plant species. The study was mainly focused on foliar pests and pathogens. However, when damage or dieback was noticed, branches and stems of affected individual plants were also examined to identify mortality agents. At sites where congeneric native and exotic plant species occurred, we quantitatively assessed attacks by leaf miners and defoliators and compared them between native and exotic plants to check various hypotheses linked to biological invasions.

Here we will present the results of this long-term study discussing its advantages and limitations and provide recommendations for a better use of botanical gardens to identify potentially harmful pests. The work has been supported by the EU FP7 Project PRATIQUE (№ 212459), COST Action FP1401 and Russian foundation for basic research (grant № 15-29-02645).