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Sentinel nurseries as tools for pathway risk assessment: insects found on Chinese woody plants commonly shipped to Europe

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BOOK OF ABSTRACTS

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All Division 7 (Forest Health) Meeting

57 - Invasive Alien Species and International Trade - Detection Prior to Introduction, Measures and Policy

K 5-7 (Konzerthaus Freiburg)

IUFRO17-882 **Identification of potentially invasive pests through sentinel plantings and surveys in botanical gardens: A manual for assessing insect and pathogen damage proposed by the COST Action "Global Warning"**

Roques, A.* (1)

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Abstract: Identifying appropriate and effective tools for the prior warning and early detection of arrivals of exotic insects and pathogens is urgently needed but extremely challenging because the potential invaders are often unknown, sometimes even to science. Recent sentinel plantings of European trees in China, and sentinel nurseries using Chinese tree species, demonstrated one method of creating lists of insects that may need to be prevented from entering Europe but the experiments also revealed many limitations. Extensive surveys of arboreta and botanical gardens provide an alternative as illustrated by recent findings of alien seed insects. However, in both cases the definition of standardized methods allowing a quick identification of the species responsible for damage is urgently needed. Under the European COST project "Global Warning", a team of European scientists combining forest entomologists and pathologists is realizing a manual proposing standard guidelines for assessing and identifying insect and pathogen damage on tree species in sentinel designs and arboreta. The manual will be presented at the conference

invasion, insects, pathogens, sentinel plants

K 5-7 (Konzerthaus Freiburg)

IUFRO17-2909 **Sentinel nurseries as tools for pathway risk assessment: insects found on Chinese woody plants commonly shipped to Europe**

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Abstract: Ornamental plants represent a major pathway of invasion for alien pests and diseases in Europe. Every year, the number of life plants and plants species imported to Europe increases, representing new threats for the European environment and economy. Pest risk analyses (PRAs) are increasingly being carried out to assess the risk posed by these new importations. However, these PRAs are limited by our reduced knowledge on the pests that these imported plants may carry. Indeed, most pests recently introduced to Europe on plants for planting had not been previously identified as quarantine pests and, thus, had not been subject to specific monitoring by inspection services at ports of entries.

We used the "sentinel nursery" technique for identifying Asian pests attacking local woody plant species that are imported into Europe. We established sentinel nurseries at two sites in China, with five Asian plant species commonly shipped to Europe at that time. These plants were surveyed during two years to obtain lists of potential Asian pests that can be expected on these imported commodities. These records were compared with those obtained from literature surveys, which are usually the only sources of information available to pest risk assessors.

A total of 109 and 114 insect species x hosts combinations were found on sentinel plants at the two sites. About 30% of the insect species were identified to species level. Although all these species were known from China, over 90% insect x host associations had not been found in a previous general literature survey of pests of the five plants, among which many abundant and damaging species. Over 70% appeared new to science. A quick assessment showed that 9% of the 223 insect records were considered to present a high likelihood of introduction, 8% a moderate likelihood and 83% a low likelihood. These results clearly show the benefit of the sentinel nursery technique to identify potential contaminants of plant importations.

sentinel nurseries; invasive species

K 5-7 (Konzerthaus Freiburg)

IUFRO17-1824 **Sentinel nurseries, plantations and arboreta, different approaches to tackle potential invasive plant pathogens before they move from their area of origin: the study case of China.**

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Abstract: Recent disease outbreaks caused by alien invasive pathogens into European forests posed a serious threat to forest sustainability with relevant environmental and economic effects. Many of the alien tree pathogens recently introduced into Europe were not previously included on any quarantine lists, thus they were not subject to phytosanitary inspections. The identification and description of alien fungi potentially pathogenic to native European flora before their introduction in Europe, is a paramount need in order to limit the risk of invasion and the impact to forest ecosystems as well as the potential role as vector of exotic trees traded to Europe. To determine the potential invasive fungi, a sentinel plantation of ecological relevant EU species and a sentinel nursery of the most traded exotic trees to EU were established in China. The fungal assemblage associated with specimens was studied using biological protocols and the tag-encoded 454 pyrosequencing of the nuclear ribosomal internal transcribed spacer-1 (ITS 1). Taxa with probable Asiatic origin were identified and included plant pathogenic genera. These results indicate that sentinel plantations and nurseries may be a strategic tool to improve the prevention of bio-invasions.

Sentinel trees; Alien Invasive Pathogens; Pathways