

The risk of invasion of Europe by forest pests and diseases, based on their worldwide occurrence

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The trade in woody plants for planting (WP4P) is a major pathway for the introduction of alien forest pests and diseases into Europe. Phytosanitary inspections at the import are essential to prevent such introductions, but the inspections are limited and target recognised pests, their hosts and shipments that are likely to contain them. The selection of inspected shipments, and thus the identification of risk, depends on expert judgement. Our aim was to provide an objective assessment of the risk posed by individual species and a prediction of potential sources of invasive species based on worldwide distribution of known pests.

We analysed distribution data for 1009 invertebrate pests and pathogens of woody hosts in 351 regions: 183 countries, plus seven large countries that were subdivided into regions. Countries and regions with similar pest species assemblages were identified for each of the organism group using hierarchical cluster analysis and the likelihood of establishment of those species was calculated as the fraction of countries within the cluster containing EU and EFTA countries where the species has been recorded as present.

Most pest species in the database are already present in one or more EU countries, which indicates that the risk of these species primarily comes from within the EU. The non-EU regions with the most similar pest species assemblages are North America, the Mediterranean region, the northern part of Eurasia and Australia/New Zealand, which have a broadly similar climatic range as the EU. However, the recent increase in trade from China, the similar climate in which WP4P for the EU market are grown in China, and relative dissimilar pest species assemblage indicates that this may be an important source of new invaders. Combining the results of this analysis with economic data provides clear indications about the likely origin of unidentified, future alien species establishing in Europe, which should be considered when assessing the risks associated with the import of WP4P.

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