Title: Firmly Rooted: Using host trees to predict new pest invasions.

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With the island of Ireland having been plagued by invasive, tree-attacking pests and pathogens such as Dutch Elm Disease in the 1970s and, more recently, Ash Dieback since 2012, how can we safeguard the ecosystem, and economic services that forestry in Ireland provides? It is well established that early detection of an invasive species is one of the most effective ways to halt its spread and prevent it from developing into a widespread disease, but this can be difficult to predict.

Unfortunately, globalisation has increased the number of potential pathways for invasive species through expanded shipping routes and greater human movement. At the same time, climate change has altered species' suitable habitats, making it more difficult to determine whether a species has become more or less invasive in the Irish climate. This raises an important question: how do we prioritise which species to monitor?

Species Distribution Models (SDMs) are commonly used tools to predict whether a specific invasive species is likely to establish itself in a new environment. We have developed a novel, evidence-based SDM approach that uses host data rather than pest data to assess a species' suitability to the Irish environment. This approach also provides a metric that allows us to rank species from highest to lowest suitability. We applied this method to both current climate conditions and projected future climate scenarios for pests that pose a high risk to oak and pine trees in Ireland.

Our findings show that many high-risk pests, though not all, are suited to the Irish climate. Moreover, the suitability of species changes over time when using these host-based models. A species that is a high priority today may become less of a concern in 20 years, highlighting the need for ongoing monitoring of a wide range of high-suitability pests.

This approach will be extended to include all known oak- and pine-damaging pest species listed by the European and Mediterranean Plant Protection Organisation (EPPO), in order to identify the highest-risk pests to Ireland.