
Predicting how altering propagule pressure changes establishment rates of exotic ant species in North America

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Abstract

Biological invasions resulting from international trade can cause major environmental and economic impacts. Propagule pressure is perhaps the most important factor influencing establishment, although actual arrival rates of species are rarely recorded. Furthermore, the pool of potential invaders includes many species that vary in their arrival rate and establishment potential. Therefore, it is essential to consider the size and composition of species pools arriving from source regions when estimating probabilities of establishment and effects of pathway infestation rates. To address this, we use a framework and modeling approach to enable prediction of future establishments in relation to changes in arrival rate across ant species pools. We utilized border interception records from the United States for ant species detected between 1914 and 2012 as proxies for arrival rates and imports data between 1860 and 2012 to model the relationship between imports, arrivals and establishment rates.

Keywords: biological invasions, ant species, arrival rate, interception, modeling, prediction, trade

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