A European invader outcompetes Canadian plants even outside its usual temperature range

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This image shows *Vincetoxicum rossicum* in the growth chamber during experiments. Credit: Laura Sanderson

Dog-strangling vine (*Vincetoxicum rossicum*) is an exotic plant

originating from the Ukraine and southeastern Russia that is becoming increasingly invasive in southern Ontario, Canada. It has been found growing successfully in both disturbed and undisturbed areas, in open fields, forest edges and understories, parks, road edges and railway embankments. The invasive plant effectively competes for light by forming large and dense stands that climb over other plants. A study published in the open access, peer-reviewed journal *NeoBiota* explores the effects of *V. rossicum* invasion in Canada.

Apart from displacing local plant species, among the ecological effects of a possible *V. rossicum* invasion are endangered populations of local soil organisms and pollinator species. Another concern is the dog strangling vine's good adaptability to and possible invasion of the alvar environment in the region, which for the Ontario is a rare kind of habitat supporting a number of important habitat-specific species. *V. rossicum* is also believed to be allelopathic, which means that in its roots, it produces chemicals that are toxic to other plants and exuded in the surrounding soil.

This image shows *V. rossicum* in competition with the local species *Solidago canadensis*. Credit: Laura Sanderson

Along with photoperiod and moisture, temperature is considered a key environmental cue for flowering. Temperature majorly affects the reproduction of the dog-strangling vine. Generally, reproduction takes longer to occur under cooler growing conditions. A slight reduction from the current growing temperature conditions of the dog-strangling vine is sufficient to produce a significant delay in budding, flowering, and the formation of seedpods. Therefore, *V. rossicum* may be limited in its capacity to spread into northern climates simply because it may not be able to complete its life-cycle. To test this possibility the authors grew *V. rossicum* under simulated temperature conditions of northern and southern Ontario. In addition, they forced *V. rossicum* to compete with

Solidago canadensis, which is highly abundant across Ontario.

Laura Sanderson and Pedro Antunes from the Invasive Species Research Institute, Canada, found that "in spite of a delay in growth under cooler conditions, *V. rossicum* produced just as many seeds as it did under temperature regimes typical of its current distribution range". They also found that competition with *S. canadensis* resulted in reductions in the fitness and total biomass of *V. rossicum*. However, the relative reductions in total biomass were greater for the competing native species, regardless of climatic temperature regime.

This image shows the great adaptability and spread of *V. rossicum* in a natural environment. Credit: Lisa Derickx

"Phenotypic plasticity may enable *V. rossicum* to spread into northern Ontario", conclude the authors.

More information: Laura A. Sanderson, Pedro M. Antunes (2013) The exotic invasive plant Vincetoxicum rossicum is a strong competitor even outside its current realized climatic temperature range. NeoBiota 16: 1, doi: 10.3897/neobiota.16.4012

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