Vincetoxicum rossicum invasion impacts on tree health in Southern Ontario

Aswini Kuruparan – Department of Biological Sciences, University of Toronto Scarborough

1. Introduction

Invasive plants are plants which have been introduced outside of their place of origin and can successfully outcompete native plants and undergo widespread dispersal (Richardson et al., 2000). An invasive plant native to Ukraine which has been spread across North America is *Vincetoxicum rossicum* commonly known as dog strangling vine (DSV) (DiTommaso et al., 2005).

Although past work has uncovered much on the effect of DSV abundance on herbaceous plants, very little is still known on its effect on woody species, particularly tree health (Sodhi et al., 2019).

Figure 1: An image of DSV. Source: http://fieldnotesjokershill.blogspot.com

2. Objective & Hypothesis

To determine if DSV abundance is associated with tree health which was quantified as 10 metrics; tree height, canopy base height, canopy height, diameter at breast height (DBH), canopy diameter, insect damage, leaf browning and yellowing, foliage transparency and crown density.

Low tree health is predicted to correlate with high DSV abundance.

3. Methods

One control site with no DSV and 5 other understory sites with DSV at the Rouge National Urban Park were used for this study. 25 trees at each site were randomly sampled and DSV within a 1 m radius around each tree was measured..

Only trees that were taller than 1.3 m and less than 10 cm in DBH were sampled to exclude larger trees with more established root systems and seedlings.

Figure 2: A map of the sites sampled at the Rouge National Urban Park. The control site is marked in red and all other sites are marked in yellow.

4. Results

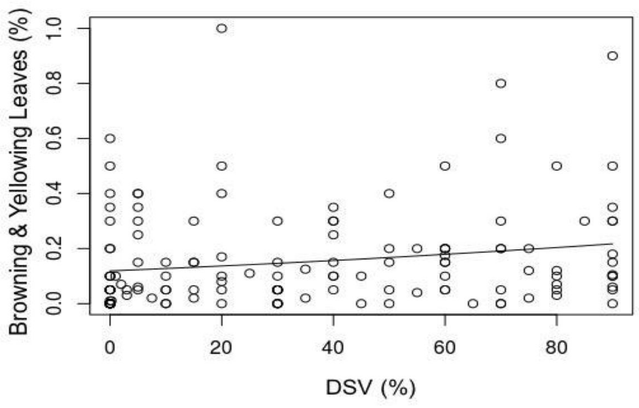

Figure 3: The relationship between DSV abundance as a percentage and the quantity of browning and yellowing leaves as a percentage.

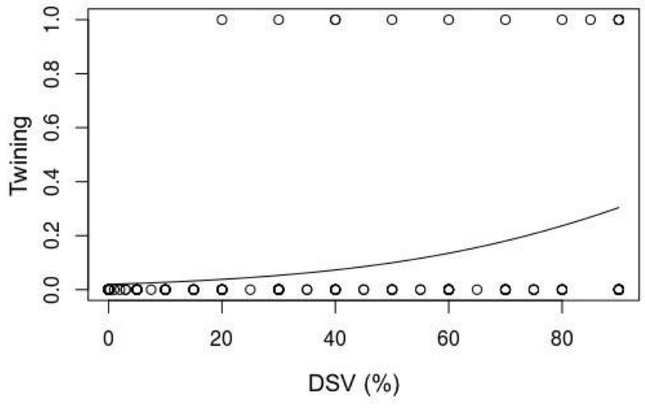

Figure 4: DSV abundance as a percentage in relation to the presence and absence of DSV twining. A 0 was used to indicate the absence of DSV twining and a 1 for the presence of twining.

As DSV abundance increased, significantly higher levels of browning and yellowing leaves and the presence of twining was observed. Tree height, canopy base height, canopy height, DBH, canopy diameter, insect damage, foliage transparency and crown density did not significantly differ with DSV abundance.

Figure 5: DSV twining around a tree. Source: www.weathernetwork.com

Figure 6: Tree leaf browning and yellowing. Source: blog.davey.com

5. Discussion

Higher tree leaf yellowing and browning and DSV twining was observed in areas with high DSV abundance which is in agreement with the hypothesis.

However, because this is an observational study, these results may be due to other confounding variables such as interactions with other plants and organisms.

A future study should plant trees surrounded by varying levels of DSV while keeping these other variables constant to determine if there is causal relationship between DSV abundance and tree health.

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