

The Impact of Exotic Plant Species on Native Plant and Invertebrate Species In York University's Keele Camp

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Abstract

This field study examining the relationship between exotic and native plant and insect species took place on York University's Keele Campus in Toronto, Canada. In total, 1,229,995 exotic plants and 614,981 native plants were observed and recorded and 1,455 insects were captured using pan traps over the course of the 3 week study period.

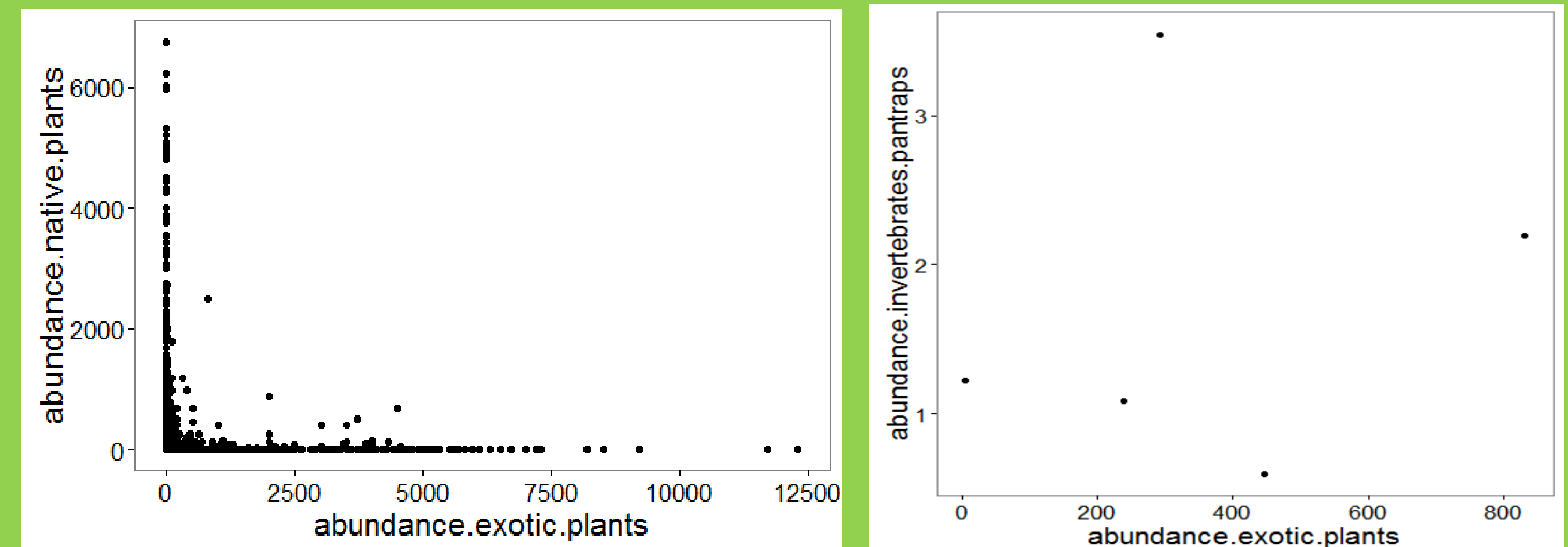
Hypothesis

- The hypothesis tested was that exotic plant species impact the abundance of native plant and invertebrate species.
- The predictions were that as the abundance of exotic plants increased, the abundance of native plants, and the abundance of invertebrates captured in pan traps would decrease

Methods

- A 50m transect was constructed in each of the habitats; forest, grassland, pond, disturbed area, and impermeable surface. Every 2m along the transect, a 1m² quadrat was placed within which abundance of native plants and exotic plants was visually counted.
- 6 pan traps were placed 3m apart from one another along the transect and abundance of invertebrates captured was counted after 30 minutes. The data was then statistically analyzed using Correlation Comparison tests (RStudio software).

Graphs Showing Correlation Tests of the Data



Results

My hypothesis and both predictions were not supported, as the results of the statistical tests show that there is no correlation between Abundance of Exotic Plants and Abundance of Native Plants, nor between Abundance of Exotic Plants and Abundance of Invertebrates.

Discussion

- Exotic species hypothesized to have context-dependent competitive advantage
- Due to competitive release hypothesis; the exotic species is free of its native consumers
- Exploitative competition between exotic and native plants; competition for shared resources

Conclusion

These results contradict similar published studies. These studies suggest that native plant and invertebrate abundance will decline if the exotic plant displaces the native plants by outcompeting them.

This study demonstrates the great degree of variability in context possible even within a single university campus, and thus points to the key importance of taking into account context when examining net interactions between exotic and native plants in future study.

Could prove significant in conservation efforts, particularly amidst the current ecological context variation generated by climate change and increased levels of atmospheric CO₂ and other greenhouse gases.