Edge Influence on Reproductive Success of *Symphoricarpos orbiculatus*

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Introduction to Edge Effects and *S. orbiculatus*

Many have documented the effects of forest edge on vegetation. At a forested edge there is a greater amount of both biodiversity and density of vegetative species. There are two mechanisms that can lead to this distribution of species: dispersal and differential plant performance.

Differences in dispersal is often due to faunal interactions. Avian species and other herbivorous species are more abundant at forest edges and can lead to differences in deposition of viable seeds. Abiotic factors can also contribute to differential spatial patterns of dispersal.

Symphoricarpos orbiculatus, coral berry, is a shrub species that can grow in both the forest interior and forest edge. *S. orbiculatus* is found most predominately at the edge; however, it can also be found in the forest interior. This species is also very colonial and can asexually reproduce via underground rhizomes.

This study particularly focused on the differential plant performance of *S. orbiculatus* in relation to the edge.

Measuring Plant Performance

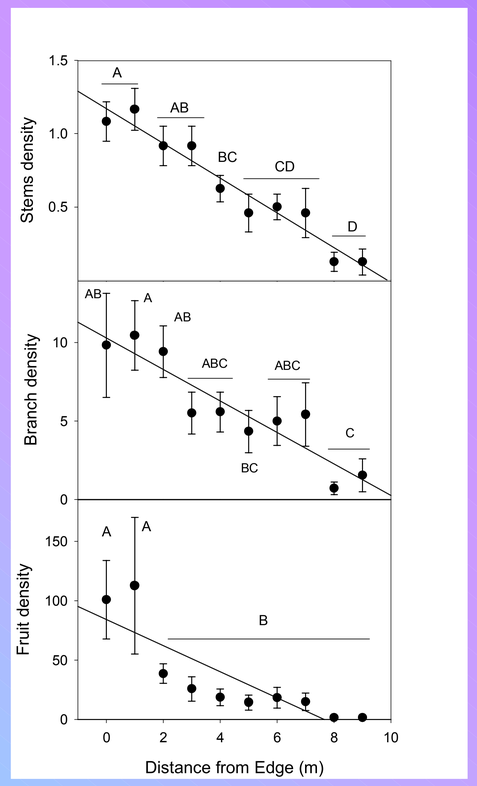
- Twelve 10x4m transects were conducted in Warbler Woods Nature Reserve, IL.
- More than 10 individuals were randomly selected from each transect at different distances from the forest edge.
- For each individual, the number of branches, number of stems, number of fruits, and distance from the edge was recorded.
- Fruits from each individual were collected after ripening and were put through stratification and germination.

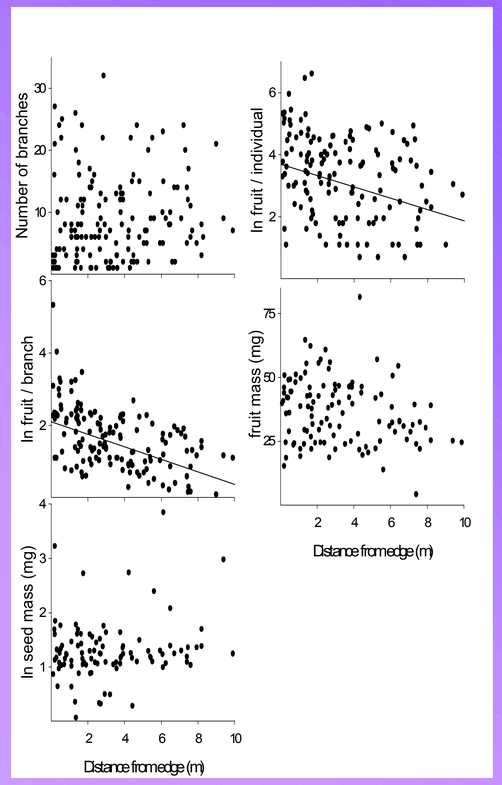
Study Questions

- Document spatial patterns of *S. orbiculatus* in relation to the edge
- Assess the vegetative performance of *S. orbiculatus* in relation to the population density along the forest edge gradient.
- Evaluate the potential for reproductive variance in *S. orbiculatus* in order to generate spatial patterns associate with edges.

Differential Performance of *S. orbiculatus*

Population density of declined with distance into the forest, with few individuals occurring eight meters into the forest. Similarly, total fruit production by each individual was positively correlated with light intensity and negatively correlated with distance from the edge. The quality of offspring produced was unaffected as the weight of individual seeds and fruits did not change significantly with distance from the edge. Seeds were ~99% viable for the entire population and did not change in response to distance along the edge.





To Left: Population density and fruit production of *Symphoricarpos orbicularis* across a forest edge gradient. Data plotted are means ± 1 SE. Line is a best-fit line through the means at each distance class. Means sharing the same letter are not statistically different at P<0.05.

To Right: Response of individual plant performance to the edge gradient. Best-fit lines are plotted on those graphs with significant correlations.

Plant Performance of *S. orbiculatus* as a Contributor to Edge Effects

This study focused on the reproductive performance of *S. orbiculatus* in relation to the edge instead of dispersal. The attempt was to determine the underlying mechanisms behind spatial patterns seen in forest edge systems by looking at the differential performance of individuals. *S. orbiculatus* individuals were shown to have a higher density at the edge and produce more fruit at forested edges. Plant reproductive performance can thus be a concluded to be a contributor spatial patterns seen in *S. orbiculatus*.

Dispersal was disregarded in this study and could influence the density of vegetation at forest edges.

With increasing amount of forest fragmentation in our environment, forest edges are increasing and influencing many vegetative species. By using this species as a model, we will be able to tell the mechanisms behind the spatial patterns seen in nature and be able to predict the effects of rapidly growing edges on different species.

Future Research to be conducted on *S. orbiculatus*

This study focused on edge effects produced by plant performance. Future studies need to be conducted to determine the edge effects that dispersal creates on *S. orbiculatus* and to conclude if plant performance or dispersal play a greater role in the distribution of species at forest edges.

Acknowledgements