THE SEEDLING SKIRMISH:
THE EFFECT OF *METROSIDEROS POLYMORPHA & PSIDIUM CATTLEYANUM* PLANT NEIGHBORS IN HAWAI‘I

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ABSTRACT

Invasive species pose a major threat to native biodiversity across the planet, especially in island plant communities that appear to be particularly vulnerable to invasive species. However, the role of neighboring plants in native plant displacement remains unclear given the lack of experiments designed to test neighbor effects explicitly. I experimentally investigated whether invasive plants impose neighbor effects on native plants as a potential mechanism underlying native species declines in Hawaiian forests. Plant neighbor effects were tested in a controlled greenhouse experiment using two ecologically important species in the Myrtaceae family: the native *Metrosideros polymorpha* and non-native *Psidium cattleyanum*. Plant performance was measured as survival and growth of plants, grown in pots alone, with a conspecific, or heterospecific neighbor. Results indicate that *P. cattleyanum* is a stronger performer than *M. polymorpha* with a lower mortality rate and higher growth rate. The *P. cattleyanum* intraspecific neighbor treatment had the lowest mean change in leaf number and height. Surprisingly, in contrast to predicted competition effects, *M. polymorpha* grown with neighbors had significantly greater shoot biomass then *M. polymorpha* grown alone. This could reflect a shift in biomass towards increased growth aboveground due to shading by neighbors, or could indicate a facilitative effect of neighbors during early seedling growth. Overall, these results indicate that the presence of a conspecific neighbor has a negative effect on plant growth, yet a heterospecific neighbor has a positive effect, suggesting that competition effects are stronger with conspecific neighbors.

Keywords: *Metrosideros polymorpha*, *Psidium cattleyanum*, competition, invasive species