

Unraveling the effects of species intra- and interspecific interactions and environmental factors on the spatial pattern of the tertiary relict plant *Tetracentron sinense* Oliver

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Abstract

The spatial pattern is critical for understanding the plant population status. The distribution patterns of endangered plants are more vulnerable to intraspecific, interspecific, and environmental factors. *Tetracentron sinense* Oliver, a tertiary relict plant, the spatial pattern, and its influencing factors are poorly understood. We sought to figure out the spatial pattern of *T. sinense* and the factors responsible for this pattern. We utilized the point pattern, ordinary kriging, and canonical correlation analysis to identify distribution patterns, spatial interactions, and environmental factors. The results revealed that *T. sinense* individuals were highly aggregated, at a small scale. Similarly, there was a positive correlation between young and adult trees at smaller scales. In addition, the dominant species showed a positive correlation with *T. sinense*; the correlation gradually became non-significant or negative as the scale increased. Furthermore, the main environmental factors affecting the distribution of *T. sinense* were air humidity, altitude, litter depth, and potassium content. These results highlighted the importance of intra- and interspecific interaction and environmental factors for the spatial distribution of *T. sinense*. Our results provide new insights into endangered species' spatial patterns and main factors. Moreover, these findings have relevant implications for conserving and managing endangered trees in a constantly fragmented habitat.

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