Mistletoe spatial patterns are poorly understood on a macroecological scale. Previous research conducted at the family-level on *Loranthaceae* from Australia demonstrated that unlike most plants, mistletoe species richness patterns do not correlate significantly with water and energy input. However, field studies suggested a relationship between the structure of the host-parasite union (haustorium) and environment. We hypothesize that haustorial type influences relationships between the abiotic environment and mistletoe spatial patterns. To investigate this hypothesis, we constructed ecological niche models for individual haustorial types. We have previously compared the distributions of haustorial types in both geographic and environmental space using geographic mapping and PCA, respectively. Here, we expand on our study by examining species richness, constructing predictive models, and emphasizing habitat types. Using the haustorial specimen collection housed at the UC Herbarium and relevant literature, we identified the haustorial type of 55 of the 73 Australia *Loranthaceae* mistletoe species. Using geographic distributional data from the *Atlas of Living Australia* and environmental data from *WorldClim*, we plotted haustorial groups in both geographic and environmental space, compared clusters in principle component space, and calculated Hutchinsonian niche overlap. We used regression to analyze the relationship between species richness and environmental variables at the haustorial level. Lastly, we constructed maximum entropy models to estimate the probability of occurrence of each haustorial group, analyzing the relative contributions of each variable to each model. We discovered that haustorial type is relatively conserved among the Australian *Loranthaceae* mistletoe genera, with seven out of nine genera exhibiting one haustorial type. Species with epicortical roots (ER), the ancestral character, are exclusively associated with coastal regions while those with derived haustorial types occur across the continent, including desert regions. Environmental analyses confirmed that species with ER are found in regions with milder temperatures and higher precipitation than derived types. Species richness patterns of some haustorial types, including ER, are significantly correlated with most environmental variables, while derived haustorial types are not. Maxent models for species with ER haustoria predict the highest probability of occurrence for coastal regions, while models constructed for derived types feature less bias for coastal regions. Our models demonstrate that relationships between the abiotic environment and mistletoe spatial patterns depend in part on the haustorial type. Hypotheses proposed to explain relationships between abiotic constraint on distribution and haustorial type include differences in water uptake efficiency, exposure of haustoria to the environment, longevity of haustoria, and host preference of species.

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