

Complicated by their hemiparasitic lifestyle, mistletoe spatial patterns are poorly understood on a macroecological scale, as past studies have demonstrated that unlike most plants, mistletoe species distributions do not correlate significantly with water and energy input. Here, we investigate mistletoe spatial patterns through a novel haustorial morphology lens, focusing on the branch parasite species of the Australian mistletoe family, Lorantheaceae. Using the haustoria collection at the *UC Herbarium* at University of California, Berkeley, we assigned 56 of the approximately 60 species of Australian Lorantheaceae, representing each of the 9 genera, to one of the following haustorial types: Epicortical Root (ER), Clasping Union (CU), Wood Rose (WR), or Bark Strand (BS), along with the following four subtypes ER-Robust, ER-WR, CU-True, and CU-BS. Using downloaded occurrence data from the *Atlas of Living Australia* and environmental data from *WorldClim*, we mapped haustorial type and genera occurrence data in both geographic and environmental space (hyperdimensional, 31D space). We used PCA to explore cluster patterns between subgroups; Euclidean distances to measure dissimilarity between clusters; and randomization tests to quantify the significance of each distance. Lastly, we constructed *MaxEnt* models to make statistical predictions of habitat suitability at novel locations. We discovered that haustorial type was mostly conserved among genera (7/9), with *Diplatia* forming both CUs and BSs and *Amyema* forming all four types. Spatial patterns differed among each haustorial type: with ER isolated to coastal regions, WR concentrated in the south, and CU and BS found across the entire continent. *Amyema sanguinea*, the sole species identified as ER-Robust, was the only ER species with a distribution beyond the coastal region. Even though the following subtypes, CU-BS and CU-True, had significantly dissimilar clusters in hyperdimensional space ($p < 0.0001$), differences in genera appear to account for this cluster dissimilarity, as differences between *Amyema* with CU-True and *Amyema* with CU-BS were not significant ($p = 0.83$). *Lysiana* (CU) and *Amyema* with BS had the most expansive, continent-wide distributions. In general, species with ER inhabited regions with the highest energy and water input relative to all other types. Maxent models predicted low habitat suitability for species with ER and non-*Lysiana* with CU beyond the northern and eastern coastal regions, while emphasizing the continent-wide distribution of *Lysiana* and species with WR and BS. Overall, our data suggests that haustorial type plays an important role in niche diversification and distributional expansion within Australian Lorantheaceae.