SPATIAL AND TEMPORAL DISTRIBUTION OF *DICROIDIUM* MORPHOSPECIES DURING THE EARLY TO LATE TRIASSIC: CORRELATION WITH PALEOCLIMATE?

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The region of Gondwana during the Triassic has been characterized as a distinct floral province, since the same higher taxa occur throughout this large region. The dominant floral element during this time was the genus, *Dicroidium*, a foliage type that has been assigned to the Corystospermales, a Mesozoic seed fern group. Initial studies of this genus indicate a great amount of morphospecies diversity between regions within Gondwana through the Early to Late Triassic. In order to test these trends and determine patterns of geographic variation in Gondwana floras at lower taxonomic levels, specimens from several regions were examined. *Dicroidium* specimens from Antarctica and other Gondwana localities were identified first-hand or from the literature using both morphological, and cuticular features when available. Classifications of form species were evaluated and standardized using morphometric techniques based mainly on pinnule shape. Subsequent paleobiogeographical analyses of species for the Antarctic and entire Gondwana region provided information regarding the spatial and temporal distribution of the plants that bore *Dicroidium* foliage. The distribution of *Dicroidium* species was compared to paleoclimate data during the Triassic to determine if morphospecies distributions were correlated with paleoclimate.

Elliptic Fourier analysis successfully separated different pinnule shapes of *Dicroidium* specimens from several different localities. Twenty-seven morphospecies were identified. Although this classification may not reflect true species, it provides a measure of variance in foliage form. Species composition among major continental regions was compared using the Simpson and Jaccard Indexes, and cluster analysis. Through time, the similarities in species composition between regions changed. During the Early Triassic, Australia and Africa had the most species in common, followed by South America and Australia for the Middle Triassic, then South America and Africa during the Late Triassic. The Indian flora was distinctly different from all other regions throughout the Triassic. Species diversity increased from Early to Late Triassic for most regions, such as Antarctica, South America and Africa. Variation in species assemblages through time exists at several localities, usually with modifications in associated plant genera, indicating environmental changes.

Regions that were spatially close were not necessarily the most similar in species composition, indicating that environmental barriers other than geography may have played a role in the distribution of species. In order to analyze other possible influences on species distribution, the biogeographical distribution of *Dicroidium* was compared to seasonal highs and lows of temperature and precipitation using a paleoclimate modeling program. A correlation of increasing species diversity with warmer and wetter paleoclimate is consistent with trends in extant flora. Regions that had more morphospecies in common, generally had a similar paleoclimate. These results imply that the distribution of *Dicroidium* was influenced more by environmental than historical factors, and supports the interpretation of a more heterogeneous biota in Gondwana than previous reconstructions have suggested. Further research on other flora and fauna at similar taxonomic levels may determine if these general trends are global or unique to plants with *Dicroidium* foliage.