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*Kalmia buxifolia* (sand-myrtle) is a species with disjunct populations across the rock outcrops of the southern Appalachians, monadnocks of the Carolina Piedmont, pine savannas of the Carolina Coastal Plain, and the New Jersey Pine Barrens. We sampled plants from each region and reconstructed the phylogeographic history of *K. buxifolia* to estimate potential direction(s) and timing of migration and date the divergence from its sister species, *K. procumbens*. We also assessed variation in water-use efficiency (WUE) to determine if *K. buxifolia* has adapted to different drought-stress regimes. Dating analysis placed the divergence of *K. buxifolia* and *K. procumbens*, in the mid-Miocene (~14.9 Ma), much later than predicted by the rock outcrop Pleistocene refugia hypothesis (<1800bp). Haplotype analysis indicated four potential refugial sites, the most ancient on Mount LeConte in GSMNP, and points to an Appalachian corridor as the likely NJ Pine Barrens colonization route. WUE results indicated that plant water-use varies geographically within *K. buxifolia*, likely driven by variation in stomatal function. These phylogeographic patterns and resulting ecophysiological diversity within *K. buxifolia* help to further characterize this species and rock outcrop communities as a whole, and may have significant implications for adaptive response to climate change.



*Kalmia buxifolia* flowering on Grandfather Mountain