Genetic Differences Between Yellowwood (*Cladrastis kentukea*) in Wild Populations Versus Urban Forests[1]

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Yellowwood (*Cladrastis kentukea*) is an uncommon, relict, tree species with a disjunct distribution primarily in the Central Hardwoods region. Most common on rocky, sheltered slopes of the Cumberland Plateau in Tennessee and Kentucky, isolated populations occur on appropriate sites throughout the southern and central United States. In Illinois, Louisiana, and South Carolina, yellowwood is listed as endangered by state conservation agencies, but it is not federally protected. Yellowwood has increased in popularity as a street tree and is planted in or predicted to be suitable for urban forests in every continental state and even parts of Canada. We investigated the genetic diversity of a sample of yellowwood from the midwestern urban forest and compared it to the genetic diversity of yellowwood populations sampled in Kentucky, Indiana, Arkansas and Missouri. We found that wild yellowwood populations are characterized by high levels of genetic differentiation and the presence of large numbers of unique alleles. Pollen movement, which is probably mediated mostly by bees, appears to be local, and migration out of current habitats unlikely. Urban yellowwoods we sampled were strongly differentiated from sampled wild populations, indicating they were not drawn from them as seed sources; rather, they may be primarily derived from yellowwood populations in Tennessee that were not sampled. Urban populations had higher heterozygosity, a much larger number of alleles, and a large number of alleles not found in any sampled natural population, indicating that they may represent a mixture of genetic material from several long-isolated wild subpopulations. Landscape and street trees could contribute to conservation and restoration of species with desirable horticultural traits, particularly when local wild populations are extirpated or suffer from depleted genetic diversity and inbreeding due to genetic isolation.

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