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NUCLEAR MICROSATELLITES AND SNPs REVEAL LOW DIVERSITY IN STONE PINE (*PINUS PINEA* L.), A GENETICALLY DEPAUPERATED SPECIES

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Genetic variation is generally considered a prerequisite for adaptation to changing environments. Thus, the discovery of genetically depauperate but geographically widespread species is unexpected. In a first work, 12 paternally inherited chloroplast microsatellites were used to estimate population genetic variation across the full range of an emblematic circum-Mediterranean conifer, stone pine (*Pinus pinea* L.). We found that the same chloroplast DNA haplotype was fixed in nearly all of the 34 populations investigated. New data at the nuclear level (14 nuclear microsatellite loci and SNPs scored among about 280 genes) also show a near absence of genetic variation. We screened the literature to identify other cases of genetically depauperate plants. This search indicates that *P. pinea* is truly exceptional among widespread, sexually reproducing plant species for its low level of genetic diversity in both chloroplast and nuclear molecular markers. Stone pine appears to have passed through at least one severe and prolonged demographic bottleneck during the Quaternary, followed by subsequent natural- and human-mediated dispersal across the Mediterranean basin during the Holocene. Measurements from provenance tests indicate that the species harbours a non-negligible amount of variation for adaptive traits. This illustrates that although there is little doubt that genetic variation is the raw material for adaptation, the relationships between neutral diversity, quantitative trait variation, and adaptability are not straightforward.

Keywords: depauperate species, diversity depletion molecular markers, *Pinus pinea*