Related Topics

Research to Develop Strategies and Technologies for Preserving Genetic Diversity in ex situ Genebanks (PGPR)

Research Project: RESEARCH TO DEVELOP STRATEGIES AND TECHNOLOGIES FOR PRESERVING PLANT GENETIC DIVERSITY IN EX SITU GENEBANKS

Location: **Plant Germplasm Preservation Research Unit**

Title: Genetic diversity and biogeographic determinants of population structure in Araucaria angustifolia Bert. O Ktze.

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Technical Abstract: Parana pine (Araucaria angustifolia) is a dioecious conifer that plays an important social and economic role, especially in the South region of Brazil. Due to changes in land use and over- harvesting of seeds and timber, the species is now listed as critically endangered (IUCN 3.1). There have been no comprehensive studies of the diversity and differentiation of this species across its range in the Brazilian Atlantic Forest. This study seeks to estimate the scale of genetic differentiation using a set of previously described microsatellite markers and correlate this measure of genetic distance to an ecologically weighted spatial distance. For this work, we have made extensive use of a collection of Parana pine developed at Embrapa 30 years ago for provenance or progeny testing. We used accessions collected from 12 sites across the species range; 10 individuals per site were included. DNA was extracted from dried cambium. SSR genotyping was conducted and the data were analyzed using several complementary approaches. Descriptive statistics among sampling sites were used to develop ranking for genetic diversity. Additionally, genetic diversity was partitioned non-hierarchically to estimate the size and composition of genetic clusters using a Bayesian assignment method. Finally genetic distances between individuals were correlated with pair-wise least cost path distances derived from niche quality models. These models were used to weight spatial distances in order to identify barriers to gene flow among the north and south regions of the species distribution range and to correlate with barriers to long-term biogeographic processes that have influenced the flora of southern Brazil. These data have important implications on future conservation planning for this species. Results from these data also have an important role in supporting forestry tree improvement programs.

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