The aims of this work were to estimate the coefficient of relatedness within families and the genetic parameters for growth related traits in a progeny test from an open-pollinated variety of Pinus caribaea Morelet hondurensis Barret & Golfari, established in Mato Grosso do Sul State, Brazil. The experimental design was the triple 10 x 10 lattice, with 96 families, three replicates, and ten plants per plot. Fourteen years after planting, the trial was measured for the following traits: total height, diameter at breast height (DBH), and true volume. The estimation of coefficients of relatedness within family from microsatellite loci indicated that families are true half-sibs ( ). Thus, the additive genetic variance ( ) can be estimated assuming that the genetic variance among progenies ( ) accounts for $\frac{1}{4}$ of additive genetic variance ( ). The estimative of heritability coefficients at individual level ( ) was relatively high (0.28 for DBH and 0.44 for height). The heritability coefficient considering the average families ( ) was also high, ranging among the traits from 0.50 to 0.58. These results suggest that the population can be improved by both massal and among families selection. Additionally, the estimated genetic gains with sequential selection among and within families were high (ranging from 8.92% for height to 37.56% for volume), demonstrating that this method of selection can generate high genetic improvement.

**Keywords**

Pinus, tree breeding, genetic parameters, microsatellite markers, coefficient of relatedness.