The independence polynomial $I(G,x)$ of a graph $G$ is the polynomial in variable $x$ in which the coefficient $a_n$ on $x^n$ gives the number of independent subsets $S \subseteq V(G)$ of vertices of $G$. We say that $I(G,x)$ is unimodal if there is an index $\mu$ such that $a_0 \leq a_1 \leq \cdots \leq a_{\mu-1} \leq a_{\mu} \geq a_{\mu+1} \geq \cdots \geq a_{d-1} \geq a_d$. While the independence polynomials of many families of graphs with highly regular structure are known to be unimodal, little is known about less regularly-structured graphs. We analyze the independence polynomials of a large infinite family of trees without regular structure and show that these polynomials are unimodal through a combinatorial analysis of the polynomials’ coefficients. (Received August 24, 2017)