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黄连木和黄山栾树的抗寒性

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Cold resistance of *Pistacia chinensis* and *Koelreuteria integrifoliola*.

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摘要

以黄连木和黄山栾树当年生休眠枝条为试材,以北方乡土树种栾树为对照,采用人工冷冻的方法,研究了3种树木枝条膜脂过氧化作用、抗氧化酶活性和有机渗透调节物质的变化,分析其抗寒能力的差异.结果表明:随着温度的降低,3种树木的电解质外渗率呈“S”型上升,SOD和POD活性均先升后降;黄山栾树和栾树的MDA、可溶性蛋白和可溶性糖含量均先上升后下降,而黄连木则呈逐渐上升的趋势;利用电解质外渗率结合Logistic方程推算的栾树、黄山栾树和黄连木的低温半致死温度(LT_{50})分别为-27.2 ℃、-23.7 ℃和-27.0 ℃.3种树木的抗寒性强弱顺序为:栾树>黄连木>黄山栾树.

关键词: 黄连木 栾树 黄山栾树 半致死温度 抗寒性

Abstract:

Taking one-year-old dormant shoots of *Pistacia chinensis* and *Koelreuteria integrifoliola* as test materials and the shoots of northern indigenous tree species *K. paniculata* as the control, the changes of their membrane-lipid peroxidation, antioxidative enzyme activity, and organic osmoregulatory substance content under artificial cooling were studied, aimed to analyze the differences of the three tree species in cold resistance. With the decrease of temperature, the ion leakage percentage of the three tree species increased in S-shape, and the SOD and POD activities decreased after an initial increase. The MDA, soluble protein, and soluble sugar contents of *K. integrifoliola* and *K. paniculata* under decreasing temperature decreased after an initial increase, while those of *P. chinensis* had an increasing trend. The semi-lethal temperature (LT_{50}) of *K. paniculata, K. integrifoliola*, and *P. chinensis* calculated by the Logistic equation of ion leakage percentage was -27.2 ℃, -23.7 ℃, and -27.0 ℃, respectively. Among the three tree species, *K. paniculata* had the strongest cold resistance, followed by *P. chinensis*, and *K. integrifoliola*.

Key words: *Pistacia chinensis* *Koelreuteria paniculata* *K. integrifoliola* semi-lethal temperature cold resistance

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