

LaCl₃对桑树组培苗生长与分化的影响

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The influence of LaCl₃ to the growth and differentiation of mulberry tissue culture seedling

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摘要

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摘要 本试验目的是通过研究不同浓度的稀土化合物(LaCl₃)对桑树组培苗生长分化以及生根的影响, 确定培养基中加入LaCl₃的浓度。在前人研究稀土元素对植物生理生化影响的基础上, 本试验将不同浓度稀土化合物(LaCl₃)添加于桑树组培苗分化与生根培养基中, 研究其对桑树组培苗生长与分化的影响。结果表明, 低浓度的LaCl₃ (40 mg/L) 能促进桑树组培苗的生长与分化, 株高、生芽数、生根率、根长和根重都显著高于对照及其他浓度处理; 分化芽数、株高及生根率分别比对照高84.2%、63.5%、12.5%。同时还能提高叶绿素含量, 其中叶绿素a含量为对照的2.06倍; 叶绿素b含量为对照的1.64倍; 以及改变光合色素比例, 提高过氧化物酶活性。高浓度LaCl₃ (60~80 mg/L) 的促进作用减小甚至抑制桑树组培苗的生长。说明本试验条件下, 有利于桑树组培苗分化及生根的LaCl₃最佳浓度为40 mg/L。

关键词: LaCl₃ 桑树组培苗 生长 分化 LaCl₃ 桑树组培苗 生长 分化

Abstract:

The aim of the study is to determine the optimum LaCl₃ concentration in culture medium of mulberry tissue seedling by testing the influence to the growth and differentiation of mulberry tissue seedling from LaCl₃ on different concentration.

Based on the work of predecessor about the influence of the rare earth element to the plant physiology biochemistry, different mass concentration LaCl₃ are chosen for culture medium to test the differentiation and growth of mulberry tissue seedling. The results show that low mass concentration rare earth element LaCl₃ (40 mg/L) can accelerate the growth and differentiation of mulberry tissue seedling. The plant height, the differentiated shoot rate, the root rate, the root length and the weight of mulberry tissue seedling are all better remarkably than the control check and the other mass concentration treatment. Plant height is 63.5% higher than the control check treatment. Rooting rate is 12.5% higher than the control check treatment. Differentiated shoots is 84.2% higher than the control check treatment. At the same time the low mass concentration rare earth element LaCl₃ (40 mg/L) can also increase chlorophyll content. The content of chlorophyll a and the content of chlorophyll b are 2.06 times and 1.64 times of the control check treatment respectively. Low mass concentration rare earth LaCl₃ (40 mg/L) can also change proportion of chlorophyll, and enhance POD activity. The high mass concentration LaCl₃ (60 mg/L, 80 mg/L) reduced or even restrain the growth of mulberry tissue seedling. Therefore, the optimum mass concentration of the rare earth element LaCl₃ that can promote differentiation and rooting of mulberry tissue seedling is 40 mg/L

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