

研究报告

植物无糖组培快繁装置及其环境控制系统的研制

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摘要:

针对常规植物组培存在的问题,从植物无糖组培实用化角度出发,研制了带有新型CO₂施放装置的180 L植物无糖组培容器及其环境控制系统,采用小流量控制、三通阀调节和PWM控制方式,实现了对CO₂浓度的精确控制,控制精度达到±50 μmol·mol⁻¹;采用穴盘覆膜与气体循环吸附相结合的方式实现了对容器内相对湿度的自动控制,控制精度达到±22%.通过圆叶海棠的无糖组培的试验,结果表明,该系统对组培苗的生长环境和生理品质的提高具有显著的促进作用.

关键词: 植物无糖组培 培养容器 环境控制系统

Design of Device for Fast Propagation of Plant Sugar-free Tissue and its Environmental Control System

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Abstract:

A 180 L culture vessel for sugar-free tissue culture with new type CO₂ releasing pipe and its environment control system were designed, aiming at solving the problems existing in conventional plant tissue culture and from the view point of practicing plant sugar-free micropropagation. By combining the three techniques of small-flow control, three-way-valve adjustment and PWM control pattern, the CO₂ concentration in side of culture vessel was controlled within ±50 μmol·mol⁻¹ around the target value. The technology of combining membrane tectoria with gas-cycle adsorption was used to realize the auto-control of inner relative humidity and the control precision has reached ± 2%. The result of experiment on culturing crabapple plant sugar-free tissue indicates that this system has the function of promoting the growth of tissue culture plantlets and improving their physiological quality.

Keywords: plant sugar-free micropropagation cultural vessel environmental control system

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