Enhancing The Productivity Of Hybrid Liriodendron Embryogenic Cultures

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Characterized by fast growth and large, colored flowers, hybrids between yellow-poplar (Liriodendron tulipifera) and Chinese tuliptree (L. chinense) may be desirable for biomass production or ornamental use. Propagation of these hybrids via somatic embryogenesis using the suspension culture protocol previously developed for yellow-poplar has been unsuccessful. A high-frequency embryogenesis system for hybrid Liriodendron was established after testing several important culture variables, including 2,4-D concentration, sucrose, medium pH value, amino acids, casein hydrolysate (CH) and abscisic acid (ABA). Embryogenic cultures consisting of proembryogenic masses (PEMs) were initiated from immature hybrid seeds on yellow-poplar induction-maintenance (IM) medium. Highest somatic embryo production (2100 germinable embryos/4000 cells or cell clumps) occurred when PEMs were grown in liquid IM medium lacking CH , followed by size fractionation and plating on development medium, which was the same formulation as induction medium, but lacking CH and 2,4-D and supplemented with 3.5~4.0mg/L ABA. Some hybrid lines also produced a high number of germinable embryos on the same development medium without ABA, while embryos of other lines germinated precociously on this medium. Optimal liquid IM medium pH value (3.5 or 5.6) for embryo production was genotype-dependent.