MORPHOLOGICALLY DIFFERENTIAL CELL CULTURES FROM SPECIFIC ORGANS OF EMBRYONIC ALEPPO AND LONGLEAF PINES

A. M. Diner[1] and R. N. Ward[2]

'Research Plant Physiologist, USDA Forest Service, Southern Research Station, Normal AL 35762
'Visiting Scientist, Plant and Soil Science Dept., Alabama A&M University, Normal, AL 35762

Abstract. Radicle tips, radicles, hypocotyls, hupocotyl apices and cotyledons were separately cut from mature embryos of aleppo and longleaf pines. Tissue cultures were grown from each cut fragment on a modified MS medium supplemented with 2,4-D (2 mg/1) and BAP (1 mg/1), and compared to those grown from the collective chopped tissues of the entire embryo. Tissues were incubated in the dark at 22C, and subcultured to freshly prepared medium of the same composition at biweekly intervals.

Radicle tips, radicles, and hypocotyl apices produced unique and dissimilar cell cultures; those from radicle tips were white to pale grey, and with limited viability. Those from radicles were white and friable through prolonged subculture. Cultures from hypocotyl apices commonly showed cell clusters of three different phenotypes, including pale yellow, white, and pale grey. The white and grey clusters assumed a nodular appearance with time and progressive growth in a prominent mucilagenous liquid matrix which provided a viscid appearance to the smooth, rounded cultures. The pale yellow clusters and cultures developed exclusively from them were similar to those grown from the mid- to low hypocotyl or cotyledons, and were irregular in shape, yellow and friable. The morphological integrity of each of these cultures remained stable through 5 months of subculture, though cultures from cotyledon bases and hypocotyl apices continually generated variable amounts of the smooth, viscid culture types distributed throughout the otherwise pale yellow, friable matrix, presumably from residual apical fragments within the cultures. Relative growth, physiology and whole-plant regenerative potential of the different cell types are now being studied.

Keywords: Pinus palustris Mill., Pinus halepensis Mill., callus, tissue culture, conifer.