P 96

In vitro Shoot Multiplication of *Echinacea purpurea*

ChungH. Park[1], A. Koroch[1], J. Kapteyn[2], H. Juliani[1], J. Simon[1]

[1]*National Crop Eexperiment Station, RDA, 209 Seodun, Suwon, Korea*

[2]*Center for New Use Agriculture and Natural Plant Products, Rutgers University, New Brunswick, USA*

[3]*Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, IN, USA*

Objectives

The genus Echinacea (purple coneflower), represented by eleven taxa found in the United States and in south central Canada, has been described as the most important plants used by the native Americans for treatment of many diseases. Echinacea has received considerable attention in recent years for its medicinal qualities and ornamental value. The objective of this study was to develop a method for rapid *in vitro* shoot multiplication from *Echinacea purpurea.*

Material and Methods

Shoots were obtained by placing leaf explants on Murashige and Skoog (MS) media containing myo-inositol (100 mg l^{-1}), thiamine (0.4 mg l^{-1}), and sucrose (2% w/v) and supplemented with BAP (4.44 μM) and NAA (0.054 μM). Shoots obtained after a 5 week culture period were used to initiate micropropagation. Multiplication was performed on the same basal media supplemented with different concentrations of 6-benzylaminopurine (BAP), kinetin (KIN) and isopentenyladenine (2iP) alone or in combination with naphthaleneacetic acid (NAA).

Results and Disscussion

Shoot multiplication of *E. purpurea* was achieved through axillary bud proliferation as a result of varying the balance of auxin to cytokinin. Proliferating shoot culture were obtained on MS media supplemented with different cytokinines alone or in several combinations with NAA. The highest number of adventitious shoots was observed on MS media supplemented with 17.76 μM BA and 0.269 μM NAA.

Kinetin was less efficient than BAP in promoting shoot multiplication, and the lowest rate of multiplication was obtained in media supplemented with 2iP. The combination of BAP and NAA was the determining factor of shoot proliferation, increasing the concentration of NAA promote shoot proliferation.

Development of a rapid multiplication system will facilitate the development of ornamental and medicinal genotypes by permitting the rapid clonal multiplication of large numbers of plants from a single elite parental selection. This shoot multiplication method will provide an efficient means of rapid shoot multiplication of a single specific genotype obtained after a relatively low efficiency regeneration event as in the case of *Agrobacterium* transformation and subsequent regeneration on selective media.

Table 1. Effect of different kinds of phyto hormone for in vitro shoots propagation of *Echinacea purpurea.*

Phytohormones (mg/L)		No. of propagated shoots		
		BAP	KIN	2iP
NAA 0	+Cytokinin 0.5	2.2±0.9	1.9±0.9	1.6±0.6
	1.0	2.3±1.2	1.9±0.9	1.7±0.7
	2.0	3.6±2.0	2.0±0.7	3.2±0.9
	4.0	3.0±1.1	3.4±1.2	2.7±0.8
NAA 0.01	+Cytokinin 0.5	2.7±0.9	1.8±0.8	1.6±0.6
	1.0	3.4±1.2	3.5±1.7	2.6±0.9
	2.0	2.7±1.3	2.5±0.6	3.6±1.0
	4.0	3.9±1.0	4.1±1.5	3.2±1.3
NAA 0.05	+Cytokinin 0.5	2.8±1.1	1.7±0.7	1.8±0.5
	1.0	4.0±1.5	2.4±1.0	2.5±0.7
	2.0	3.8±1.7	2.1±0.5	3.1±1.2
	4.0	6.1±1.7	3.2±1.4	3.0±1.4

Table 2. Effect of BA and hormone free medium for *in vitro* shoots growth and propagation of regenerated *Echinacea purpurea.*

Medium	No of shoots	Shoots height(Cm)	No of leaves	No of roots
Hormone free	1.1±0.0	4.6±1.3	5.0±0.8	1.8±1.4
BAP 2mg/L	9.8±3.7	0.9±0.2	3.0±0.7	0.0±0.0

Adventitious shoots formation of Echinaceae **Shoots formed along the vein of leaf**

Figure 1. Vein shoots formed supplemental with NAA 0.01+BAP 2 mg/L and NAA 0.05+BAP 2 mg/L only but very low.

*Corresponding author.