

Jiraporn Jiranapapan 2011: Polyploid Induction in *Torenia* Hybrids (*Torenia fournieri* × *Torenia baillonii*) and Yellow Flower Mutant *Torenia* Using Colchicine Tablets. Master of Science (Horticulture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Associate Professor Thunya Taychasinpitak, M.S. 104 pages.

Effects of colchicine tablet solution on *Torenia* hybrids (*Torenia fournieri* × *Torenia baillonii*) and yellow flower mutant *torenia* were studied. Leaves were cut and soaked in different concentrations of colchicine solution : 0, 5, 10, 15 and 20 ppm for 0, 1, 2 and 3 days. It was found that survival rate, plant height, plant width and numbers of branches decreased when colchicine concentration and treatment duration were increased. Fourteen putative polyploidy plants of *Torenia* hybrids and seven plants of yellow flower mutant *torenia* were selected based on morphological and cytological variations, such as slower growth, darker green leaves, thicker leaves, larger leaves or flower and increased length stomata. The results of chromosome counting confirmed that there were fourteen tetraploid plants of *Torenia* hybrids and seven tetraploid plants of yellow flower mutant *torenia*, which the chromosome number of both plants were $2n = 4x = 34$. The highest frequency of tetraploid induction of *Torenia* hybrids and yellow flower mutant *torenia* were 0.08 at 15 ppm of colchicine solution for 2 days and 0.06 at 20 ppm of colchicine solution for 1 days. Morphological characteristics of polyploid and diploid plants of two cultivars were compared. It was found that the plant height, plant width and numbers of branches of polyploid plants of *Torenia* hybrids were increased, which plant height and width of polyploid plants of yellow flower mutant *torenia* were decreased whereas numbers of branches were increased when compared with diploid plants. Both of plants stem thickness, length, width and leaves thickness were increased when compared with diploid plants and morphological changes of leaves. The flower characteristics of polyploid plants of two cultivars showed larger flower sizes than diploid plants. No significant differences were observed for number of flowers of *Torenia* hybrids between diploid and polyploid plants and petal thickness of polyploid plants were increased after stem cutting 30 days but no significant difference after stem cutting 60 days when compared with diploid plants. Petals of the polyploid plants tended to be more crinkly. It was found that number of flowers of polyploid plants of yellow flower mutant *torenia* were decreased but no significant difference in petal thickness between diploid and polyploid plants. Tube of the polyploid plants were shorter than diploid plants. Cytological characteristics of polyploid and diploid plants of two cultivars were compared. Pollen and stomata sizes of polyploid plants were larger and stomata density were lower than diploid plants. Pollen viability of polyploid plants were higher than diploid plants. Self ability of polyploid plants of both plants were increased when compared with diploid plants.

Student's signature

Thesis Advisor's signature