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In vitro* Induced Polyploidy in *Celosia argentea* var. *plumosa

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Abstract

Celosia argentea L., Amaranthaceae, is an annual herb cultivated for its medicinal, nutritional and horticultural values. It is rich with minerals, proteins, vitamins and several other compounds such as saponins, alkaloids, peptides, glycosides, flavonoids, amino acids and fatty acids. Medicinal properties of this plant are applied in traditional medicine to treat tumors, jaundice, fever, diarrhea, inflammation and various other diseases. As an ornamental plant it is particularly grown for its flowers. Somatic induced polyploidisation *in vitro* is one of the methods used in breeding programs of ornamental plants. Chromosome doubling usually increases plant vigour and enhances morphological traits like flower shape and size.

The aim of this study was to obtain octoploid plants ($2n = 72$) from tetraploid *Celosia argentea* var. *plumosa* ($2n = 36$) by *in vitro* induced polyploidy. In total 320 nodal segments were treated with oryzalin at concentrations of 20, 40, 60 and 80 μM along two time intervals of 24 and 48 hours. The level of ploidy of the affected plants was determined using flow cytometry.

Four octoploid plants were obtained, of which three plants at the concentration of 40 μM for 24 hours and one plant at the concentration of 60 μM for 24 hours. *In vitro* morphological changes such as thicker stems, more compact growth and larger leaf area size were observed in newly acquired genotypes compared to control plants. In the second phase of the research, newly acquired genotypes will be evaluated in *in vivo* conditions for better analysis of morphological and biochemical properties.

Keywords: Amaranthaceae, *Celosia argentea* var. *plumosa*, flowcytometry, oryzalin, polyploidy