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In vitro Mitotic Chromosome Doubling by Chemical Treatments in *Lilium longiflorum*

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Objectives

In vitro mitotic chromosome doubling was carried out to produce tetraploid production. Three chemicals, colchicine, oryzalin and caffeine, were tested to increase efficiency in *Lilium* hybrid.

Materials and methods

Plant materials

In vitro bulb scales were used as material. Bulb scale was cut 5x5mm, treated in the chemical solution and cultured in 1/2 MS solid media supplement with 50g/L sucrose, pH 5.8.

Chemical treatments

A range of different concentration of colchicine, oryzalin and caffeine were tested with different time. The regenerated bulblets were tested by FCM for the determination of ploidy level.

Results and discussion

The survival rate of colchicine treatments was 100% in a range of concentration and treatment time, however, the number of regeneration was dramatically reduced. The best efficiency was at the treatment of 3 hours in 1000 mg/L colchicine. In the oryzalin treatment, the survival rate was the same, however, the regeneration ability was higher than in colchicine treatment. The efficiency was also similar to colchicine. Caffeine treatments showed relatively good results in 0.9% with efficiency of 11.7. Although three chemicals showed similar efficiency according to bulblets regeneration, survival rate and tetraploidy formation, the oryzalin or caffeine treatment for in vitro chromosome doubling would be better than colchicine known as carcinogen.

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