

Effects of Day Length and Medium Concentration on the in Vitro Flower Formation of *Celosia*®

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INTRODUCTION

In order to find optimal conditions for in vitro flower formation we screened for suitable flowers in Experiment 1 and examined the effects of day length and medium concentration on flower formation in Experiment 2.

MATERIALS AND METHODS

Experiment 1. Seeds of commercial cultivars of *Catharanthus roseus* (L.) G. Don. (two cultivars), *Celosia argentea* var. *cristata* hort. (four cultivars), *Helianthus annuus* L. (two cultivars), and *Torenia fournieri* Linden ex E. Fourn. (two cultivars) were sown on selected concentrations of basal Murashige and Skoog salts (MS) medium ($\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$ MS) and were cultured under conditions of 10-h day length (short-day) or 16 h-day length (long-day).

Experiment 2. To obtain larger in vitro flowering plants MS medium concentrations and periods of long-day were examined in two cultivars, 'Strawberry' and 'Mango', of *C. argentea* var. *cristata*. The cultivars were seeded on a $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$ MS medium. The length of long-day (16-h day length) treatment 0, 15, 30, or 45 days were applied for vegetative stage growth, followed by the short-day (10 h-day length) for flowering.

RESULTS AND DISCUSSION

Experiment 1. Four *C. argentea* var. *cristata* cultivars 'Kinpou', 'Mango', 'Strawberry', and 'Yachiyo', easily formed flowers under the short-day condition on any medium. In *H. annuus* and *T. fournieri* cultivars, in vitro flower formation was also observed, however, the frequencies of flowering was very low. No flower formation was observed in any cultivars of *C. roseus*.

Experiment 2. Larger in vitro flowering plants of *C. argentea* var. *cristata* were produced under the long-day periods of 30 and 45 days in two cultivars, 'Mango' and 'Strawberry'. Since the lower leaves had withered with age, in vitro flowering plants obtained from the 45-day period exhibited shorter flowering time than those produced from the 30-day period. The frequency of flowering was the highest in the plants grown on $\frac{1}{4}$ and $\frac{1}{8}$ MS media. Flower color was the deepest in plants grown on a $\frac{1}{8}$ MS medium.

From these results, we selected four cultivars of *C. argentea* var. *cristata*, 'Kinpou', 'Mango', 'Strawberry', and 'Yachiyo', as the most suitable for in vitro flowering studies. The best environmental conditions for in vitro flower formation are as follows: seeds are sown on a $\frac{1}{8}$ MS basal medium and cultured under the long-day condition (16 h-day length) for 30 days of vegetative growth, followed by a short-day treatment (10 h-day length) for flower formation.