

The Growth of Laterally Split Carnation Shoot Tips

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In a recent review (2) reports are noted that indicate it may be possible for a graft union to be established in meristematic tissues. However Ball (1) has found in Lupinus albus no good union was established between shoot apices split centrally. The variation of carnations may be influenced by the shoot tip technique (4). The following experiment tested the possibility of grafting carnation shoot tips and further noted the effect of the splitting on the variation or mutation of these tips.

Methods and Materials

Twenty-nine carnation shoot tips from Brigadoon (a yellow seedling variety) and from Shibuya's Pink (a Sim sport) were cut centrally perpendicular to the plane through the base of the youngest visible leaf pair (see Fig. 1). One half-tip of each variety was placed in a prepared culture tube. The two cut surfaces were placed approximately together with the two split meristems matched and uppermost in the tube.

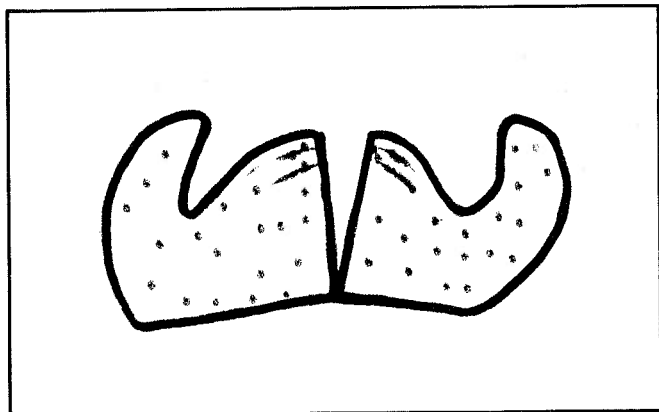


Fig. 1. An illustration of the split carnation shoot tip. Two normal plants may develop from a split tip.

The tubes contained autoclaved carnation shoot tip media (2). The tips were supplied with constant fluorescent light of 200 ft-c and grown at a temperature of $65^{\circ}\text{F} \pm 5$ in the culture chamber. When possible, the tips were grown to mature flowering plants.

Results

The laterally paired tips did not graft at the shoot tip. However, the split tips appeared to become united by callus material which formed at the cut base.

The tips were transferred to the greenhouse, planted, and allowed to grow to maturity and flower. Eleven of the tips lived and flowered. In all cases the plants were normal with respect to flower shape, color, and plant habit. Three of the plants produced pink flowers and appeared to be normal Shibuya's Pink, while eight appeared to be normal Brigadoon plants. In no case were two colors formed on a single plant.

Discussion

The results indicate that while there was some union of the basal callus, no graft union occurred between laterally split carnation shoot tips. These results are in agreement with the observations of Ball (1). The split halves regenerated and formed normal shoots which, in turn, developed into normal mature plants. Commonly when the shoot tip is bisected by a vertical incision two new apices are regenerated from the flanks of the original apical meristem (2). The carnation tips in this test essentially followed the behavior of these bisected tips. No variation or mutation as a result of the surgical technique was noted. The color sports of Sim are probably periclinal chimeras. If so, the regeneration of tissue at the meristem of Shibuya's Pink did not appear to change the tissue orientation.

Literature Cited

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