Reversion of Floral Buds of *Kalanchoe Pinnata* Pers. to Vegetative State in Culture

H. Y. Mohan Ram and Mridul Wadhi

Department of Botany, University of Delhi, Delhi-7

The cultivation of post-anthesis flowers has enabled a better understanding of some aspects of fruit development [*1*]. The attempts to grow young buds to study floral morphogenesis are very few and are of recent date [*2, 3*]. The present work was initiated to test whether an immature floral bud could attain its full development in vitro or to what extent its morphogenetic pattern could be altered by manipulation of the nutritive medium.

Flower buds of two different stages were used. The older buds (3 mm in length) contained all the four floral whorls and their anthers were at the archesporial stage. The younger buds (0.5 mm in length) had well developed sepals (Fig. 1 A) but only the primordia of the other floral parts. The buds were surface sterilized and planted on modified White's medium [*4*] without IAA (WB). Supplements like NAA, 2.4-D, kinetin and coconut milk (CM) were added singly and in combination. The cultures were maintained at a temperature of $25 \pm 2°$ C and a light intensity of 10 ft-c.

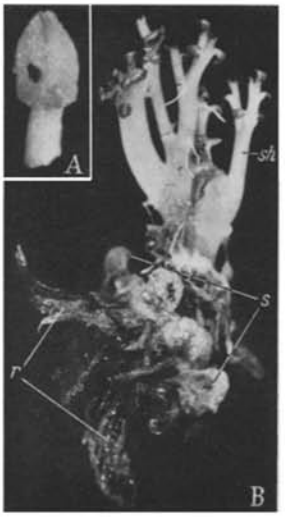

Fig. 1. *A*: A flower bud (0.5 mm in length) at the time of planting. ×42. *B*: Development of shoots (*sh*) and roots (*r*) from a flower bud grown for 28 weeks on WB + CM (10 %) + 2.4-D (1 ppm). Remnants of sepals (*s*) are seen as bulges. × 18

White's medium alone failed to support the growth of flower buds of either stage. On WB+NAA (1 or 5 ppm), 60—71% of the cultures showed profuse rooting. Rooting was more copious in the older than in the younger buds. Roots originated from the torus tissue situated between the calyx and corolla. In the younger buds even the cutend rooted. On WB+CM (10%) the buds merely dried up. With the addition of 2.4-D (1 ppm) to WB + CM, however, the buds formed either only roots, or roots with a little callus, or both roots and shoots (Fig. 1B). As many as 10—12 shoots emerged from a single floral bud. Of these, some appeared normal and others fasciated. The incidence of shoot formation was more common in the younger (56%) than in the older (15%) buds. On WB+kinetin (1 ppm) the older buds failed to grow. Of the 12 younger buds cultured, only one showed the development of two leafy shoots. Rooting was totally suppressed on this medium.

Microtome sections of the buds raised on WB + CM + 2.4-D and WB + kinetin showed that the shoot meristems also originated from the torus tissue. None of the treatments supported the normal development of buds into flowers. Our present investigation suggests that immature flower buds receive some morphogenetic stimulus when they are in organic contact with the rest of the plant. The exact nature of the stimulus needs further investigation. Nevertheless, when isolated and provided with appropriate chemical milieu, the immature floral buds are able to revert to a vegetative condition.

We are grateful to the late Professor P. MAHESHWARI, F. R. S., for his valuable counsel.

Eingegangen am 27. Mai 1966

[1] NITSCH, J. P.: Encyclopedia of Plant Physiology (ed. W. RUHLAND), vol. 15, p. 1537. Berlin-Heidelberg-New York: Springer 1965. — [2] GALUN, E., Y. JUNG, and A. LANG: Nature 194, 596 (1962). — [3] TEPFER, S. S., R. I. GREYSON, W. R. CRAIG, and J. L. HINDMAN: Am. J. Bot. 50, 1035 (1963). — [4] RANGA SWAMY, N. S.: Phytomorphology 11, 109 (1961).