REGULATION OF GLADIOLUS VASE-LIFE BY KINETIN

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LONGEVITY of detached plant parts inclusive of flowers, is generally increased by using antitranspirants, preservatives, growth retardants, antibiotics and plant hormones[1-3]. The anti-senescence property of cytokinis, a plant hormone, therefore, may be suitably exploited by florists for adding a few days to the life of their valuable cut flowers. The potentiality of such an application has been examined in the present study.

Spikes of Gladiolus var Scarlet were employed at a stage when their basal florets were semi-open with petals just visible and the rest of the florets were at tight-bud stage. The spikes were made uniform by retaining 12 florets (including 3 basal semi-open ones) per spike of 50 cm length. Eight spikes were placed individually in the 50 ml of water or kinetin solutions (10^{-6}M to 10^{-2}M). The spikes were maintained at 25 $\pm$1°C with 8 hr photoperiod of normal day-light illumination. The opening and fading of florets were noted till all the florets in control spikes faded. The relative hastening or delaying effect was calculated from the mean time taken by 50% of population for opening and fading of florets (figure 1).

Kinetin at 10^{-6}M and 10^{-5}M concentrations resulted in faster opening of the florets, 10^{-4}M delayed it, while 10^{-3}M and 10^{-2}M proved lethal (figure 1). The extent and nature of concentration effect changed with the passage of time. As is to be expected the 10^{-6}M concentration of kinetin led to slightly higher percentage of fading upto 8th day. While the 10^{-5}M did not influence fading and acted similar to control, the 10^{-4}M concentration significantly delayed the fading process.

The hastened opening of florets by low concentrations of kinetin (10^{-6}M and 10^{-5}M) may be attributed to the primary function of cytokinins in increasing cell division and cell elongation[4]. The delay in opening caused by higher concentration (10^{-4}M) suggests the dual role of kinetin, as well documented in various physiological phenomenon. The delay in fading and the consequent extension of the longevity of florets conforms to the established role of kinetin in delaying senescence. The latter effect has been attributed to the maintenance of high nucleic acid and protein levels[4], and inhibition of ethylene biosynthesis[5, 6].

This study on cut Gladioli confirms the potentiality of regulating the vase-life of flowers by kinetin.

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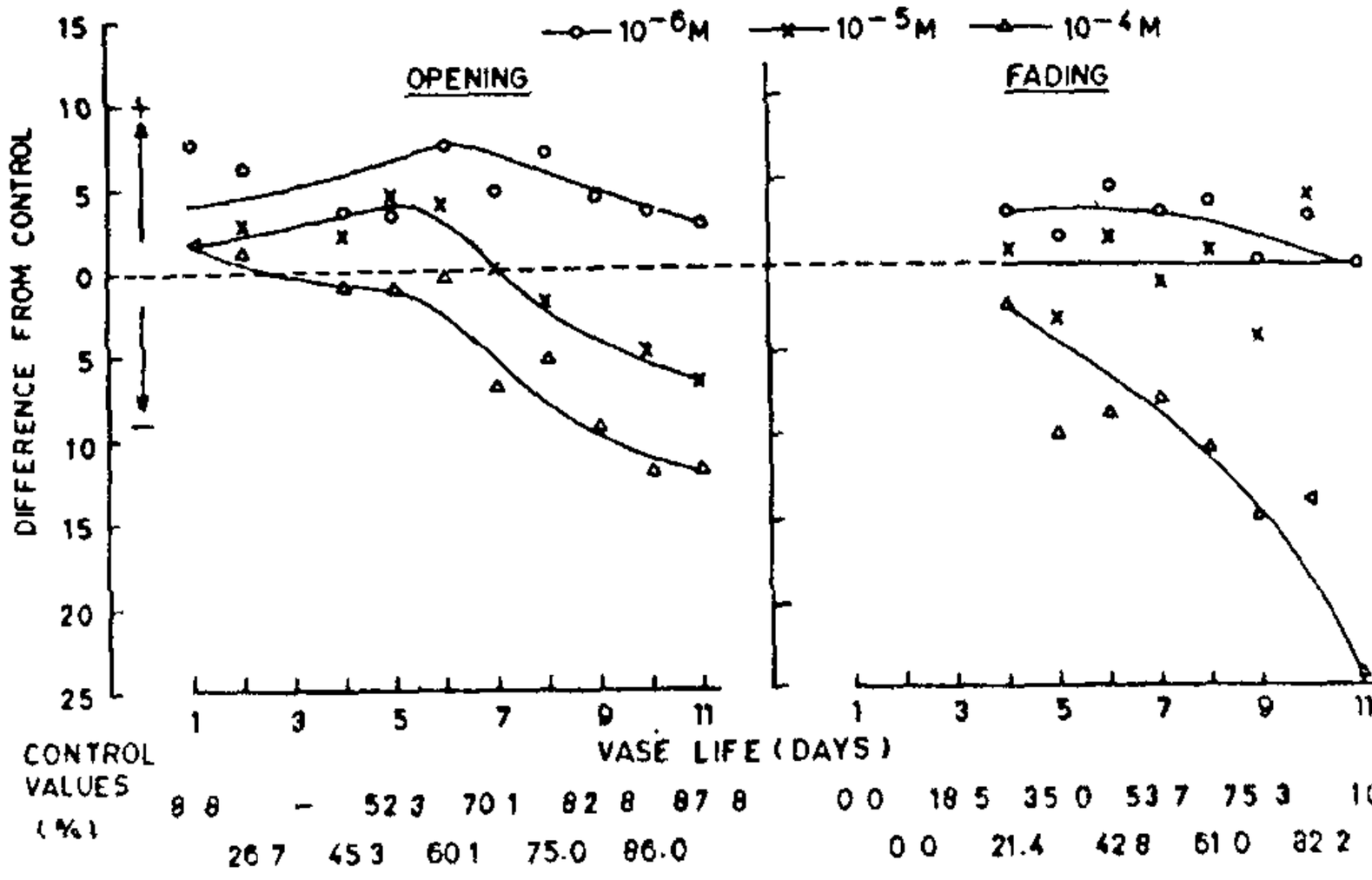

Figure 1. Concentration dependent opening and fading of cut gladiolus flowers.

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CUTICULAR PATTERN IN SOME BURROWING AND NON-BURROWING MARINE ISOPODS

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It is known that the cuticle of Crustacean plays an important role in transpiration, water balance and also acts as a protective covering to the internal organs of the body[1]. The structure and chemical composition of the cuticle of Crustaceans have been studied in detail[2,3]. Sphaeromatidae belong to a group of Isopod crustaceans which are predominantly marine and adapt themselves to different ecological niches. The peculiarities of their cuticle compared to those of other Crustaceans are traceable to the adaptation of semi-terrestrial habits shown in varying degrees by members of this group. However, knowledge on Sphaeromatidae has so far been meagre. This family includes isopods which are associated with underwater wooden structures, while some of them destroy wood by boring into them, others are foulers. Since the cuticle, which is an important organ system forming the boundary between the internal and external environments of the animal, may reflect in structure and chemical composition the adaptive modifications to the peculiar modes of life; a detailed study of its structure and chemical pattern in a wood borer, (*Sphaeroma terebrans*), a fouler (*Sphaeroma walkeri*) and a free living form (*Cirolana fluviatilis*), was made.

Paraffin sections of 8 μ were cut and stained in Mallory's triple and Masson's trichrome. Gelatine sections were used for detection of protein and calcium. Total protein content was estimated by micro-kjeldahl and calcium content was estimated by Ballentine and Burford[4] methods. Ten sets of the sample were taken to estimate protein and calcium.

A comparison of the structural peculiarities of the burrowing and non-burrowing Sphaeromids show differences. The epicuticle in *S. terebrans* lacks an outer lipid layer while in the allied forms *S. walkeri* and *C. fluviatilis* this layer is present. The cuticle of *S. terebrans* shows spinous projections on its outer surface whereas that of *S. walkeri* and *C. fluviatilis* have a thicker cuticle lacking spines. The protein component of the epicuticle of *S. terebrans* is unlike that of *S. walkeri* in not containing, a tyrosine containing fuchsinophilic protein. In *S. walkeri* the epicuticle contains a fuchsinophilic protein and gives evidence of primary tanning as indicated by its reaction to the detanning agents like alkaline stannite solution and diaphenol. In the free-living *C. fluviatilis* the epicuticle conforms to the condition noted in other crustaceans in containing a fuchsinophilic protein which in the intermoult stage undergoes hardening by tanning, resulting in the formation of sclerotin. The procuticle of *S. terebrans* is hardened throughout the moult cycle, giving evidence of only a biuret positive protein and a sulphur containing protein. In the procuticle of *S. walkeri* tanning resulting in sclerotin does not take place. In *C. fluviatilis* the outer layer of the procuticle is modified giving rise to a sclerotised exocuticle.

The total protein levels of the cuticle obtained in the three species show that its range is less in *S. terebrans* (6.6%) than the other two where it is 8.2% and 6.2%. In all the three species, an increase is seen in the protein content from the freshmoult to the postmoult upto the intermoult stage, when the maximum values are reached. The value decreases during premoult.

Though the cuticle is calcified in all the three isopods, quantitative variations are seen. The total calcium in the cuticle of *S. terebrans* shows that it is 13.6% while in *S. walkeri* it is 34.0%. The free-living *C. fluviatilis* contains even less calcium (9.5%).

Moulting in *S. walkeri* is peculiar in that the cuticle of the anterior half of the body moults first, followed by the shedding of the cuticle of the posterior half, unlike the condition normal to isopods.

From the above observations, it is suggested that the absence of protein precursor of tanning in the epicuticle and the absence of hardening in the epicuticle, as well as the abbreviation of calcification in the procuticle are features of *S. terebrans* which may be related to the boring habit of the animal. In the nature of the cuticle, the fouler *S. walkeri*, by com-