Morphology and Physiology of Petal Cells

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ABSTRACT

Post harvest physiology of flowers relies largely on the turgidity of the petals which is maintained by various preservatives. Studying petal morphology and physiology of its cells helps understand the how and why of the delicate water relation of petals. Experiments were conducted with petal discs to find out the osmotic concentration of the preservative best suitable for particular flowers. *Tagetes* and *Chrysanthemum* flowers were selected. Microscopic measurements of the epidermal peels were helpful in examining the optimum osmotic concentration of the protoplasm for maximum uptake of water and / or preservative solution.

Keywords: Petal, Physiology, *Tagetes*, *Chrysanthemum.*

INTRODUCTION

Post harvest physiology and cut flower longevity of flowers is largely related to the maintenance of the turgidity of the petals which is maintained by various preservatives (Halevy *et al*.,1981). Another important aspect is the water relationship of the flowers. Marousky (1971) showed an increase in fresh weight of cut flowers by improving water balance is a major factor in determining the quality and longevity of the cut flowers. When water is being removed from a cell, the turgor pressure decrease until the cytoplasm is no longer pressing hard on the cell wall. When the cytoplasm starts to pull away from the cell wall is called "incipient plasmolysis"- full plasmolysis is reached when the cytoplasm has completely withdrawn from the cell wall. Microscopic measurements of the epidermal peels were helpful in examining the optimum osmotic concentration of the protoplasm for maximum uptake of water and / or preservative solution. Sucrose is commonly added to keeping solution because it decreases respiration rate, fresh weigh and dry weight. (Goszgynska *et al.,* 1990).

MATERIALS AND METHODS

Studying morphology and physiology of *Tagetes* and *Chrysanthemum* petal cells helps understand the how and why of the delicate flower relation of petals. Experiments were conducted with petal discs to find out the osmotic concentration of the preservative best suitable for particular flowers were selected. Generally, the flowers were collected from the Botanical garden of the department.

Here, preservative solution was taken in small watch glass and flower petals were put after removing epidermal peels in different concentrations of sucrose. The whole set was kept at room temperature (27± 1) æ%C. The slide was observed under microscope after every hour. Camera lucida sketches were taken at the end of hour. This was done at 100X magnification. Then stained photographs were also taken at different time intervals. The various sucrose concentrations tested for find out the osmotic concentration of the petal cells are as follows:-

PLANT	SUCROSE CONCENTRATION
Tagetes	0.1% to 10%
Chrysanthemum	1% to 20%

RESULT AND DISCUSSION

Microscopic measurement of the epidermal peels were helpful in examining the optimum osmotic concentration of the protoplasm for maximum uptake of water and/or preservative solution (sucrose). During the study plasmolysis was noticed in different concentration of sucrose but the best result of incipient plasmolysis was obtained in *Tagetes* in 1% sucrose after 1 hour and in *Chrysanthemum* in 10% sucrose after 24 hours. Thus, optimum concentration of sucrose on the cytoplasm was found. It varies from species to species. Sucrose in high concentration (5%-20%) supplied as a short treatment to cut flowers accumulates in the cells, increasing the osmotic potential of the petals. This enables the treated flowers to absorb much more water compared to untreated flowers. Several metabolic sugars are equally effective in this response but the non metabolic sugar manitol is not effective. Osmotic adjustment has also been observed with several mineral salts like KCL, KNO_3 and NH_4NO_3.

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