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# Postharvest Structural and Physiological Responses of Cut Narcissus Stems (*Narcissus tazetta, N. papyraceus*)

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## Abstract

Postharvest vase life of cut flowers depends on stem water relations. Anatomical changes in stems of Iranian narcissus during the first three days after harvest showed tissue collapse without xylem occlusion, despite increased bacterial populations. Stem tissue collapse, rather than vascular blockage, was the primary factor reducing stem integrity.

## Introduction

- ✓ Water uptake and xylem functionality are critical for cut flower longevity.
- ✓ Xylem blockage is a common cause of postharvest water stress in many species.
- ✓ In narcissus, postharvest stem anatomical responses are poorly understood.

➢ Objective:

To investigate early postharvest anatomical changes in narcissus stems.

## Materials and methods

- ✓ Plant material: 10 Iranian populations of *N. tazetta* and *N. papyraceus.*
- ✓ Harvest stage: First flower opening
- ✓ Conditions: 23°C, 60% RH, 12 h photoperiod
- ✓ Stem analysis:
  - Cross-sections at day 0 and day 3
  - Polarized light microscopy
  - Morphometric traits measured using ImageJ
- ✓ Bacterial analysis: Colony counts from vase solutions

➢ Statistics: ANOVA, Duncan's test ($P < 0.05$)

## Results and discussion

**Stem Anatomical Changes**

- ✓ Significant reductions in:
  - Stem perimeter and area
  - Vascular bundle size
  - Shape indices (Feret diameters, major, minor, solidity)
- ➢ Changes indicate tissue shrinkage and collapse by day 3.

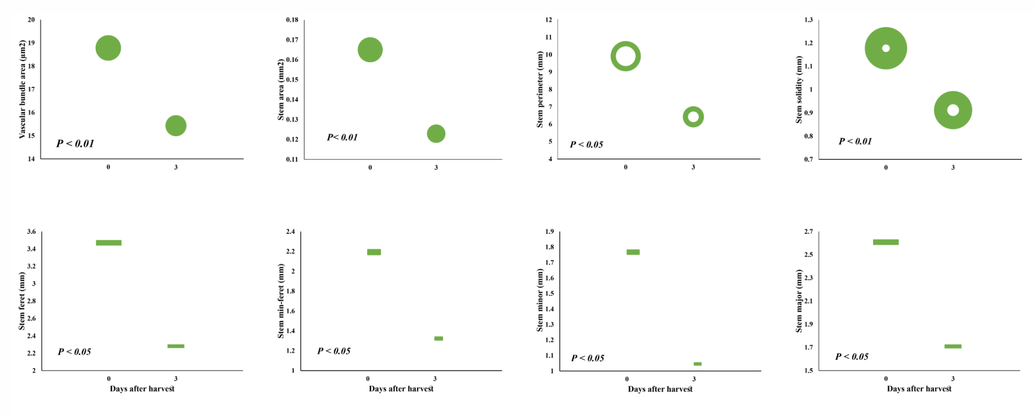


Fig. 1 Quantitative changes in the stem and vascular bundles of Iranian narcissus after three days of storage in vase.

**Absence of Xylem Occlusion**

No xylem blockage observed in freshly harvested and 3-day stored stems.

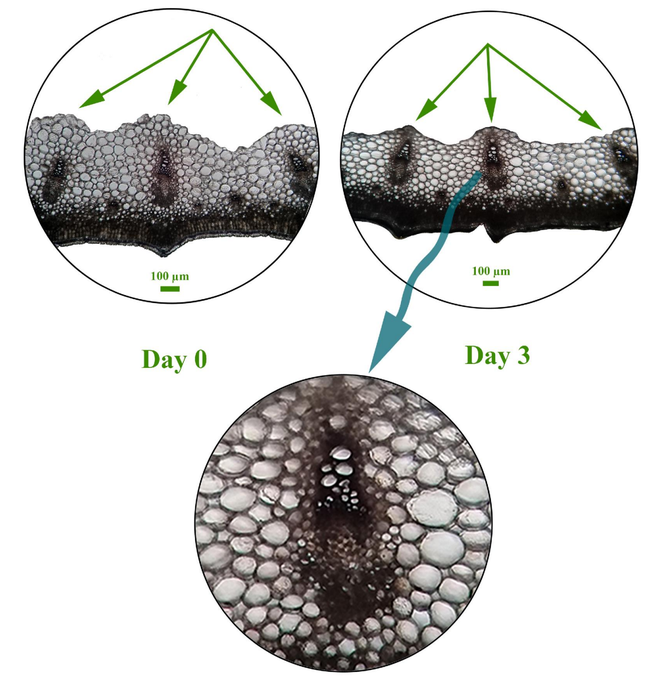


Figure 2. Microscopic images of vascular bundles in the stem of Iranian Narcissus in freshly harvested stems and after three days of storage in vase. Microscopic images were taken with a polarized light microscope and a mobile phone camera. The lack of vascular blockage on the third day is evident in the lower image. Green arrows indicate the collapse of stem tissue cells near the central cavity of the stem.

**Conclusion**

Parenchymal tissue collapse, not vascular occlusion, is the primary factor affecting early postharvest stem integrity in Iranian narcissus.

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