

# Partitioning of transpiration to cut flower organs and its mediating role on vase life response to dry handling: a case study in chrysanthemum

Dimitrios Fanourakis, Eleftheria Papadopoulou, Apostolia Valla, Vasileios A. Tzanakakis and Panayiotis A. Nektarios

Postharvest Biology and Technology, Volume 181, November 2021, 111636

---

## Abstract

The mediating role of water relations on vase life response to prior desiccation (dry handling) was addressed in cut chrysanthemum. In the first part of the study, the contribution of different organs to whole-cut flower transpiration was determined in 12 cultivars. During desiccation, leaf transpiration decreased owing to stomatal closure. Instead, no active regulation was apparent in either stem or flower. Cultivar differences in leaf transpiration were related to the weight loss required to induce stomatal closure ( $R^2=0.919$ ). A small portion of cut flower transpiration was through the flower ( $12.3\pm 0.3\%$ ), with the major contributor being either leaves or stem, depending on the water status and the cultivar. Leaf transpiration was positively correlated with whole-cut flower transpiration ( $R^2=0.879$ ). In the second part of the study, the postharvest longevity upon arrival and following desiccation (5 or 10 % weight loss) was determined on six cultivars with contrasting whole-cut flower transpiration rates. In these cultivars, the rehydration ability following a dehydration event, petal carbohydrate and soluble protein contents, as well as leaf carbohydrate, soluble protein and mineral contents were also assessed. Impaired water transport, as a result of prior desiccation, was not associated with the vase life response to dry handling. A strong correlation between whole-cut flower transpiration in the desiccation experiment and the vase life response to prior desiccation was found. Low vase life decrease in response to prior desiccation was associated with decreased whole-cut flower transpiration during the postharvest period. In conclusion, cultivar differences in vase life response to prior desiccation were attributed to variation in leaf stomatal characteristics.