

Title Cultivar differences in the stomatal characteristics of cut roses grown at high relative humidity
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Citation ISHS Acta Horticulturae 847:251-258. 2009.
Keyword abscisic acid; desiccation; *Rosa hybrida*; stomatal density; stomatal size; pore size

Abstract

High relative air humidity (RH>85%) during cultivation is known to reduce the vase life of cut roses, but the magnitude of such effect is cultivar dependent. The reasons behind this genotypic variation are not yet known. In this study, the stomatal density and stomatal responses to two closing stimuli (i.e. desiccation and abscisic acid (ABA) application) were evaluated using detached fully expanded leaves of two contrasting rose cultivars in their sensitivity to high RH ('Frisco' and 'Prophyta') which were grown at moderate (60%) and high (90%) RH. High RH significantly increased the stomatal density in both cultivars, but the effect was stronger in the tolerant cultivar (14% increase for 'Frisco', 8% increase for 'Prophyta'). 'Frisco' also showed a higher stomatal density at moderate RH (53 stomata/mm²) as compared to the sensitive cultivar (43 stomata/mm²). Moreover, high RH decreased the speed and the degree to which stomata responded to different closing stimuli in both cultivars, resulting in higher transpiration rates. This effect was more pronounced in the sensitive cultivar. It was concluded that the tolerance to high RH during cultivation is related to more responsive stomata, while the stomatal density is apparently an irrelevant character. Furthermore, this study showed that the rose guard cell dimensions are not representative for the pore dimensions.