Title Improving water balance and vase life of cut foliage branches of Dodonaea 'Dana' by postharvest treatments

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Abstract

Dodonaea viscosa hybrid cv. 'Dana' is one of the new foliage branches selected and cultivated in Israel. It has a high export potential as decorative foliage, but has a limited vase life due to leaf wilting. The wilting problem of cut *Dodonaea* 'Dana' branches results from improper water conductance, which may be caused by xylem vessel occlusions, air embolism, or increased transpiration. Therefore, our research was focused on studying the anatomical properties of *Dodonaea* 'Dana', as well as on examining the effect of various postharvest treatments on water balance parameters to extend branch longevity. Anatomical analysis revealed that the *Dodonaea* 'Dana' stems are of diffuse-porous type and are enriched with fibers. In the xylem of the leaf petioles some unidentified depositions were observed, which increased during vase life. Dipping the branches in a commercial antitranspirant solution (Folicote) reduced transpiration but did not improve vase life, suggesting that leaf wilting may result from vessel blockage rather than from increased transpiration. Pulsing *Dodonaea* 'Dana' branches for 24 h with a solution composed of aluminum sulfate (TOG-10), organic chlorine (TOG-6) and the ethylene action inhibitor, silver thiosulfate (STS), improved longevity, due to a positive effect on branch fresh weight (FW), leaf water potential and water uptake. Holding *Dodonaea* 'Dana' branches in warm (40°C) water for 30 min improved their water uptake. These treatments probably overcome the problems of vessel occlusions and air embolism. Storage of the branches for 24 h at 6°C to simulate air transportation caused leaf abscission and reduced the branch FW during vase life, suggesting that they should be transported at temperatures higher than 6°C. Our results suggest that treatments which affect the water balance status of *Dodonaea* 'Dana' cut branches can significantly improve their quality and prolong their shelf life.