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FOLIAR APPLICATION OF METHYL JASMONATE AFFECTED GROWTH, LEAF PHYSIOLOGY PARAMETERS AND AQUAPORIN GENES EXPRESSION IN DROUGHT-STRESSED IMPATIENS WALLERIANA

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This research evaluated the effects of foliarly applied elicitor methyl jasmonate (MeJA) on the potential improvement of drought tolerance in *Impatiens walleriana*. Growth and leaf physiology parameters (Stomatal conductance, Chlorophyll, Flavonoid, Anthocyanin, and Nitrogen Balance Index - NBI), as well the expression of four aquaporin genes (*IwPIP1;4*, *IwPIP2;2*, *IwPIP2;7* and *IwTIP4;1*), were evaluated. These parameters could serve as indicators of drought tolerance in *I. walleriana*, a worldwide popular horticultural plant, very sensitive to drought. The experiment included four treatments: control plants, drought-stressed plants foliarly sprayed with distilled water, drought-stressed plants foliarly sprayed with 5 μM MeJA, and drought-stressed plants foliarly sprayed with 50 μM MeJA. Foliar spraying was performed seven days before drought induction, and on the day of drought stress induction. The stressed plant groups were non-irrigated to reach 15 and 5% soil water content (SWC), while control plants were well-watered (35-37% SWC) during the entire experiment. Drought reduced fresh and dry shoot weight, as well total leaf area but dry matter content was not affected. Foliarly applied MeJA improved growth parameters, depending on the elicitor concentration and drought intensity. Stomatal conductance was slightly reduced at 5% SWC in plants foliarly sprayed with MeJA regardless of the used concentration. Similarly, the flavonoid index was reduced at 15 and 5% SWC when 50 μM MeJA was foliarly applied, while there were no observed changes in the anthocyanin index in any treatment. The foliar application of 50 μM MeJA increased *I. walleriana* chlorophyll index and NBI at 5% SWC, indicating an elicitor contribution to plant drought tolerance at physiological level. Among the four analyzed aquaporin genes, expression of *IwPIP1;4* and *IwPIP2;7* was strongly induced in drought-stressed plants foliarly pre-treated with 50 μM MeJA, indicating an improvement of water flow through cells to maintain homeostasis.

Keywords: *Impatiens walleriana*, methyl jasmonate, drought, leaf physiology, aquaporins

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