

Title Water stress increases cytokinin biosynthesis and delays postharvest yellowing of broccoli florets

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Abstract

Postharvest yellowing is a limiting factor in the shelf-life of broccoli florets. Postharvest treatments have been used to prevent this problem but with limited success. Focusing on preharvest treatments, we tested whether water stress during plant growth increases cytokinin biosynthesis and delays postharvest yellowing of broccoli florets. Broccoli was grown under water soil pressure (WSP) of 0.4 MPa (high water stress), 0.2 MPa (moderate water stress) and 0.04 MPa (without water stress). The broccoli florets were harvested, kept at 23 ± 0.2 °C, and analysed at 12 h intervals, from 0 to 96 h, for ethylene production, respiration rate and colour. Zeatin (Z) and zeatin ribose (ZR) contents were analysed in the broccoli florets 24 h after harvest. Despite the fact that ethylene production and respiration rates were higher in broccoli florets from plants grown at high water stress, green colour was significantly better retained in these florets. We observed that the contents of Z and ZR were higher in the broccoli florets from the high water stress treatment. Our results show that water stress was effective in delaying postharvest yellowing of broccoli florets and suggest that the delay was due to increases in cytokinin biosynthesis, at least in terms of Z and ZR.