Methyl jasmonate promotes wound healing by activation of phenylpropanoid metabolism in harvested kiwifruit

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Postharvest Biology and Technology, Volume 175, May 2021, 111472

Abstract

A rapid wound healing in vegetables and fruit is instrumental in maintaining fruit quality and extension of shelf life. In this study, wounded kiwifruit were separately treated with methyl jasmonate (MeJA) and diethyldithiocarbamic acid (DIECA, an inhibitor of jasmonate biosynthesis) to evaluate the effect of MeJA on wound healing of kiwifruit. The results showed that MeJA treatment leads to increases of endogenous JA biosynthesis, lipoxygenase (LOX) and 12-oxo-phytodienoic acid reductase (OPR) activities, and JA synthesis genes expression, while DIECA represses these processes. Meanwhile, MeJA promoted the autofluorescence of suberin polyphenolic (SPP) and the accumulation of SPP monomers. MeJA-treated group demonstrated significantly enhanced total phenols, flavonoids, and lignin contents. Besides, MeJA promoted the activities of phenylalanine ammonia-lyase (PAL), cinnamic acid-4-hydroxylase (C4H), 4-COumaric-COA ligase (4CL), peroxidase (POD), polyphenol oxidase (PPO), and the respective gene expression levels. Results suggest that wound healing in kiwifruit could be promoted by MeJA via activation of phenylpropanoid metabolism.