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*Pv*LOX2 silencing in common bean roots impairs arbuscular mycorrhiza-induced resistance without affecting symbiosis establishment

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Abstract

The arbuscular mycorrhizal (AM) symbiosis is an intimate association between specific soil-borne fungi and the roots of most land plants. AM colonisation elicits an enhanced defence resistance against pathogens, known as mycorrhizal-induced resistance (MIR). This mechanism locally and systemically sensitises plant tissues to boost their basal defence response. Although a role for oxylipins in MIR has been proposed, it has not yet been experimentally confirmed. In this study, when the common bean (*Phaseolus vulgaris* L.) lipooxygenase *Pv*LOX2 was silenced in roots of composite plants, leaves of silenced plants lost their capacity to exhibit MIR against the foliar pathogen *Sclerotinia sclerotiorum*, even though they were colonised normally. *Pv*LOX6, a LOX gene family member, is involved in JA biosynthesis in the common bean. Downregulation of *Pv*LOX2 and *Pv*LOX6 in leaves of *Pv*LOX2 root-silenced plants coincides with the loss of MIR, suggesting that these genes could be involved in the onset and spreading of the mycorrhiza-induced defence response.

Additional keywords: fungi, RNA silencing, systemic resistance.

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