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Mechanism of Avenanthramide Induction

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Abstract:
Oat leaves produce phytoalexins, avenanthramides, in response to pathogen infection and elicitor treatment. Feeding experiments with labeled precursors and measuring enzyme activities revealed the biosynthetic pathway for avenanthramides. In addition, the enzyme that catalyzes the final biosynthetic reaction was identified. An accumulation of similar hydroxycinnamic acid amides was found in maize and barley under stress, suggesting the generality of the defense reaction that involves hydroxycinnamic acid amides. The metabolism of avenanthramides was analyzed using labeled compounds. Avenanthramides were metabolized by the oat leaf itself and were incorporated into cell walls. The elicitor treatment induced peroxidase activity that accepts avenanthramides as substrates. These findings suggested that avenanthramides serve as substrates for the reinforcement of cell walls.

Keywords:
phytoalexin, avenanthramide, biosynthesis, metabolism, *Avena sativa*

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