



# Structural and functional characterization of the *Colletotrichum lindemuthianum nit1* gene, which encodes a nitrate reductase enzyme

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**ABSTRACT.** *Colletotrichum lindemuthianum* is the causal agent of plant bean anthracnose, one of the most important diseases affecting the common bean. We investigated the structure and expression of the *nit1* gene (nitrate reductase) of *C. lindemuthianum*. The *nit1* gene open reading frame contains 2787 bp, interrupted by a single 69-bp intron. The predicted protein has 905 amino acids; it shows high identity with the nitrate reductase of *C. higginsianum* (79%) and *C. graminicola* (73%). Expression of *nit1* in *C. lindemuthianum* was evaluated in mycelia grown on different nitrogen sources under conditions of activation and repression. The gene was expressed after 15 min of induction with nitrate, reaching maximum expression at 360 min. The transcription was repressed in mycelia grown in media enriched with ammonia, urea or glutamine. Twenty *nit1*<sup>-</sup> mutants were obtained in a medium treated with chlorate. Ten of these mutants were characterized by DNA hybridization, which identified point mutations, a deletion and an insertion. These rearrangements in the *nit1* gene in the different mutants may have occurred through activity of transposable elements.

**Key words:** *Colletotrichum lindemuthianum*; Nitrate reductase; Anthracnose; *Phaseolus vulgaris*