

Cloning of nitric oxide associated 1 (NOA1) transcript from oil palm (*Elaeis guineensis*) and its expression during *Ganoderma* infection

ABSTRACT

Nitric oxide associated 1 (NOA1) protein is implicated in plant disease resistance and nitric oxide (NO) biosynthesis. A full-length cDNA encoding of NOA1 protein from oil palm (*Elaeis guineensis*) was isolated and designated as EgNOA1. Sequence analysis suggested that EgNOA1 was a circular permuted GTPase with high similarity to the bacterial YqeH protein of the YawG/Y1qF family. The gene expression of EgNOA1 and NO production in oil palm root tissues treated with *Ganoderma boninense*, the causal agent of basal stem rot (BSR) disease were profiled to investigate the involvement of EgNOA1 during fungal infection and association with NO biosynthesis. Real-time PCR (qPCR) analysis revealed that the transcript abundance of EgNOA1 in root tissues was increased by *G. boninense* treatment. NO burst in *Ganoderma*-treated root tissue was detected using Griess reagent, in advance of the up-regulation of the EgNOA1 transcript. This indicates that NO production was independent of EgNOA1. However, the induced expression of EgNOA1 in *Ganoderma*-treated root tissues implies that it might be involved in plant defense responses against pathogen infection.

Keyword: Circular permuted GTPase; *Ganoderma*; NOA1; Nitric oxide; Oil palm