

**Thiamine biosynthesis gene expression analysis in *Elaeis guineensis* during interactions with *Hendersonia toruloidea***

ABSTRACT

Thiamine plays an indispensable role as a cofactor in many metabolic reactions in all living organisms. The active form, thiamine pyrophosphate (TPP) functions as a cofactor in important metabolic reactions including glycolysis, pentose phosphate pathway and the tricarboxylic acid cycle. Besides that, thiamine is also associated with the induction of systemic acquired resistance (SAR) in plants. *Hendersonia toruloidea* is an endophytic fungus originally isolated from oil palm roots which have been shown to have biocontrol activity. Seven months old oil palm seedlings were inoculated with *H. toruloidea* and the response on the expression of thiamine biosynthesis genes were investigated. Microscopy analysis was performed to visualise the colonisation of the fungus. Ribonucleic acid (RNA) was extracted from oil palm leaves at Day 1, 7, 15 and 30 post-treatment. Quantitative Real-time PCR (qRT-PCR) was performed to measure the level of expression of four key thiamine biosynthesis genes, namely *THI4*, *THIC*, *TH1* and *TPK*. The results showed up to 12-fold increase in the expression of all gene transcripts at Day 1 and 7 post-treatment. This work provides first evidence of enhancement of thiamine biosynthesis by endophytic colonisation in oil palm seedlings.

**Keyword:** Endophytic fungus; Gene expression; Oil palm; Thiamine biosynthesis