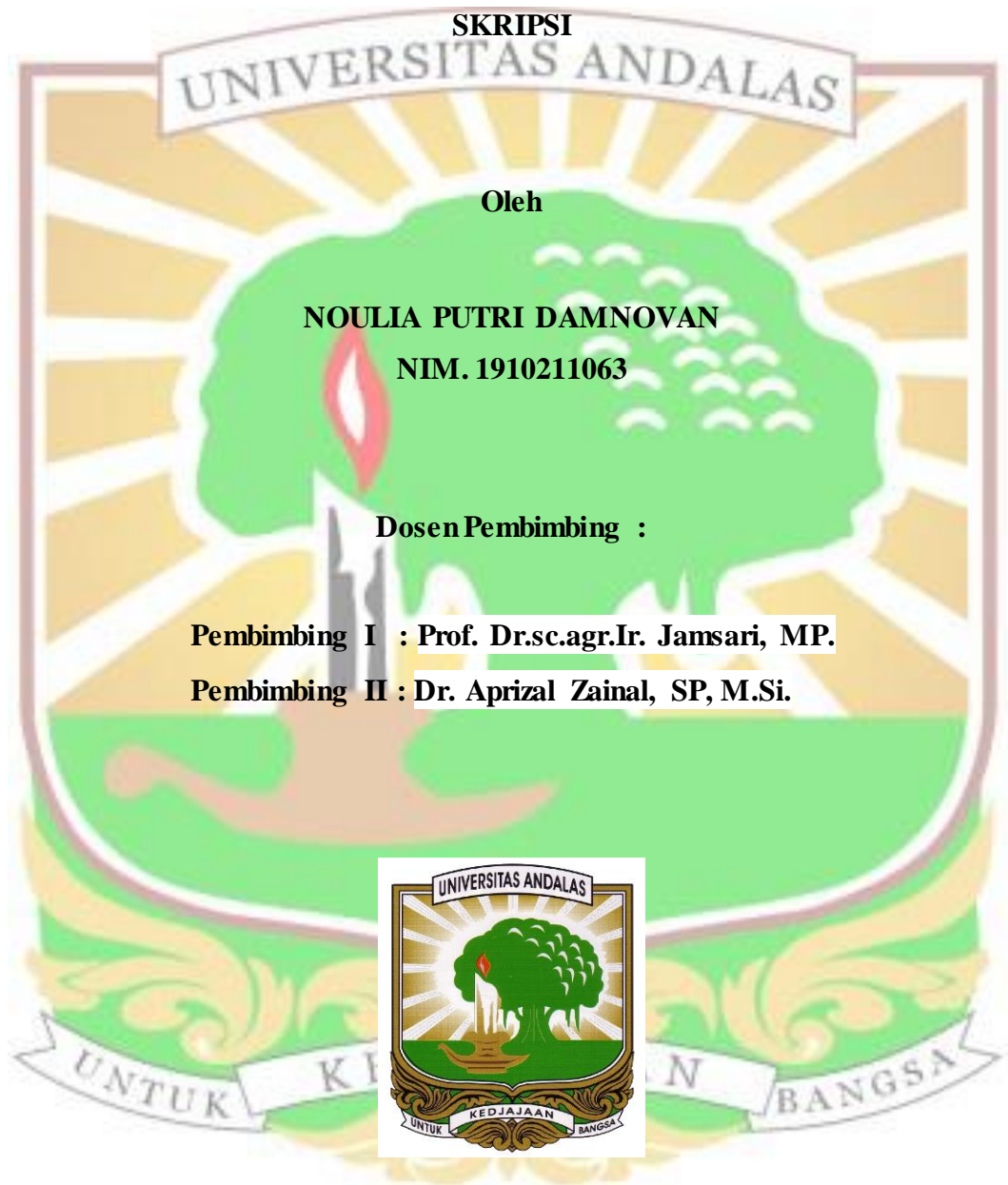


**PROFIL TRANSKRIPT GEN *HPT1* SELAMA BIOSINTESIS
VITAMIN E PADA TIGA AKSESI TANAMAN BUNGA
MATAHARI (*Helianthus annuus* L.)**



**FAKULTAS PERTANIAN
UNIVERSITAS ANDALAS
PADANG
2024**

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Abstrak

Bunga matahari (*Helianthus annuus* L.) merupakan salah satu komoditas penting tanaman penghasil minyak nabati. Upaya untuk meningkatkan produksi biji bunga matahari dapat dicapai menggunakan aksesori terpilih sehingga dapat diusulkan untuk varietas unggul. Masing-masing aksesori pada bunga matahari memiliki jumlah kandungan α -tokoferol yang berbeda. Senyawa tokoferol dikendalikan oleh gen-gen yang berperan dalam biosintesis vitamin E, salah satunya gen *HPT1*. Ekspresi berlebihan gen *HPT1* menghasilkan peningkatan tokoferol hingga 2 kali lipat dalam biji dan 9 kali lipat pada daun selada transgenik. Penelitian ini bertujuan untuk mendapatkan profil ekspresi gen *HPT1* selama biosintesis vitamin E pada tiga aksesori tanaman bunga matahari (*Helianthus annuus* L.) Ha1, Hu3 dan Ha15. Prosedur penelitian dimulai dari penanaman, isolasi RNA total (fase R3, R5, dan R8), sintesis cDNA, *Real Time PCR* (qPCR), analisis kadar vitamin E dan antioksidan. Hasil penelitian menunjukkan bahwa aksesori Hu3 dan Ha1 mengalami peningkatan level ekspresi gen *HPT1* tertinggi pada fase R3 yakni 1,65 dan 2,76 kali lipat. Sedangkan aksesori Ha15 memperlihatkan peningkatan level ekspresi gen *HPT1* pada fase R5 yakni 1,21 kali lipat. Kadar vitamin E tertinggi dihasilkan oleh aksesori Hu3 sebesar 6,53 $\mu\text{g/mL}$ dan terendah aksesori Ha15 sebesar 1,55 $\mu\text{g/mL}$.

Kata Kunci : Tokoferol, *Helianthus annuus*, gen *HPT1*, Vitamin E, qPCR



TRANSCRIPT PROFILE OF *HPT1* GENE DURING VITAMIN E BIOSYNTHESIS IN THREE ACCESSIONS OF SUNFLOWER PLANT (*Helianthus annuus* L.)

Abstract

Sunflower (*Helianthus annuus* L.) is one of the important commodities of edible oil producing crops. Efforts to increase sunflower seed production can be achieved using selected accessions so that they can be proposed for superior varieties. Each accession in sunflower has a different amount of α -tocopherol content. Tocopherol compounds are controlled by genes that play a role in vitamin E biosynthesis, one of which is the *HPT1* gene. Overexpression of the *HPT1* gene results in a 2-fold increase in tocopherol in seeds and 9-fold in transgenic lettuce leaves. This study aims to obtain the expression profile of the *HPT1* gene during vitamin E biosynthesis in three accessions of sunflower plants (*Helianthus annuus* L.) Ha1, Hu3 and Ha15. The research procedure started from planting, RNA isolation (R3, R5, and R8 phases), cDNA synthesis, Real Time PCR (qPCR), analysis of vitamin E and antioxidant levels. The results showed that accessions Hu3 and Ha1 showed the highest increase in *HPT1* gene expression levels during R3 phase, with a value 1.65 and 2.76 times. While accession Ha15 increased the level of *HPT1* gene expression in the R5 phase up to 1.21 times. The highest vitamin E level was produced by accession Hu3 of 6.53 $\mu\text{g/mL}$ and the lowest was accession Ha15 of 1.55 $\mu\text{g/mL}$.

Keywords : Tocopherol, *Helianthus annuus*, *HPT1* gene, Vitamin E, qPCR

