

Analisis Perbandingan Profil Ekspresi Gen HbWRKY40 terhadap Infeksi *Pestalotiopsis* sp. Penyebab Penyakit Gugur Daun pada *Hevea brasiliensis* (Willd. Ex A. Juss) Mull. Arg. Klon RRIC 100 dan GT 1 = Comparative Analysis of HbWRKY40 Gene Expression Profiles in Response *Pestalotiopsis* sp. Infection Causing Leaf Fall Disease in *Hevea brasiliensis* (Willd. Ex A. Juss) Mull. Arg. Clones RRIC 100 and GT I

Ushulil Hidayat, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920575182&lokasi=lokal>

Abstrak

Salah satu penyebab penurunan produksi karet Indonesia diketahui disebabkan oleh serangan patogen *Pestalotiopsis*. Salah satu solusi paling relevan dalam mengatasi permasalahan tersebut adalah melalui pembentukan klon karet yang resistan terhadap infeksi *Pestalotiopsis*. Pembentukan klon karet resistan membutuhkan pemahaman tentang gen-gen terkait pertahanan tanaman. Gen *Hevea brasiliensis* WRKY40 menjadi salah satu gen pertahanan yang diduga berperan penting dalam memediasi pertahanan tanaman karet. Tujuan penelitian adalah menyajikan informasi mengenai pola peningkatan dan perbedaan ekspresi gen HbWRKY40 pada tanaman karet terhadap infeksi *Pestalotiopsis* pada klon moderat RRIC 100 dan rentan GT 1. Hipotesis penelitian ini adalah terdapat pola peningkatan ekspresi gen HbWRKY40 pada H. *brasiliensis* terhadap infeksi *Pestalotiopsis* dan terdapat perbedaan level ekspresi gen HbWRKY40 pada kedua klon. Penelitian dimulai dengan melakukan ekstraksi RNA daun H. *brasiliensis* berbasis spin column, yang kemudian diubah menjadi cDNA melalui metode reverse transcriptase polymerase chain reaction (RT-PCR). Sintesis cDNA yang diperoleh digunakan dalam analisis ekspresi gen berbasis quantitative polymerase chain reaction (qPCR) sehingga didapatkan nilai quantification cycle (Cq). Nilai tersebut dihitung menggunakan rumus Livak (2-Cq) untuk melihat tingkat ekspresi gen dalam satuan perubahan kelipatan (fold change). Hasil penelitian menunjukkan ekspresi gen HbWRKY40 pada tanaman karet yang terinfeksi *Pestalotiopsis* meningkat pada hari ke-4 dan 6 setelah inokulasi. Selain itu, tingkat ekspresi gen HbWRKY40 pada klon moderat RRIC 100 lebih rendah daripada klon rentan GT 1.

.....One of the causes of the decline in Indonesian rubber production is known to be due to attacks by the *Pestalotiopsis* pathogen. One of the most relevant solutions to this problem is the creation of rubber clones that are resistant to *Pestalotiopsis* infection. The creation of resistant rubber clones requires an understanding of the genes related to plant defense. The *Hevea brasiliensis* WRKY40 gene is one of the defense genes that is thought to play an important role in mediating the defense of rubber plants. The objective of this study is to present information on the pattern of increase and differences in the expression of the HbWRKY40 gene in rubber plants against *Pestalotiopsis* infection in the moderate RRIC 100 and susceptible GT 1 clones. The hypothesis of this study is that there is a pattern of increased expression of the HbWRKY40 gene in H. *brasiliensis* against *Pestalotiopsis* infection and that there are differences in the expression levels of the HbWRKY40 gene between the two clones. The study began with RNA extraction from H. *brasiliensis* leaves using a spin column, which was then converted into cDNA via reverse transcriptase polymerase chain reaction (RT-PCR). The synthesized cDNA was used in gene expression analysis based on quantitative polymerase chain reaction (qPCR), yielding quantification cycle (Cq) values. These values were calculated

using the Livak formula (2^{-Cq}) to determine gene expression levels in terms of fold change. The results showed that the expression of the HbWRKY40 gene in rubber plants infected with *Pestalotiopsis* sp. increased on days 4 and 6 after inoculation. In addition, the level of HbWRKY40 gene expression in the RRIC 100 moderate clone was lower than that in the GT 1 susceptible clone.