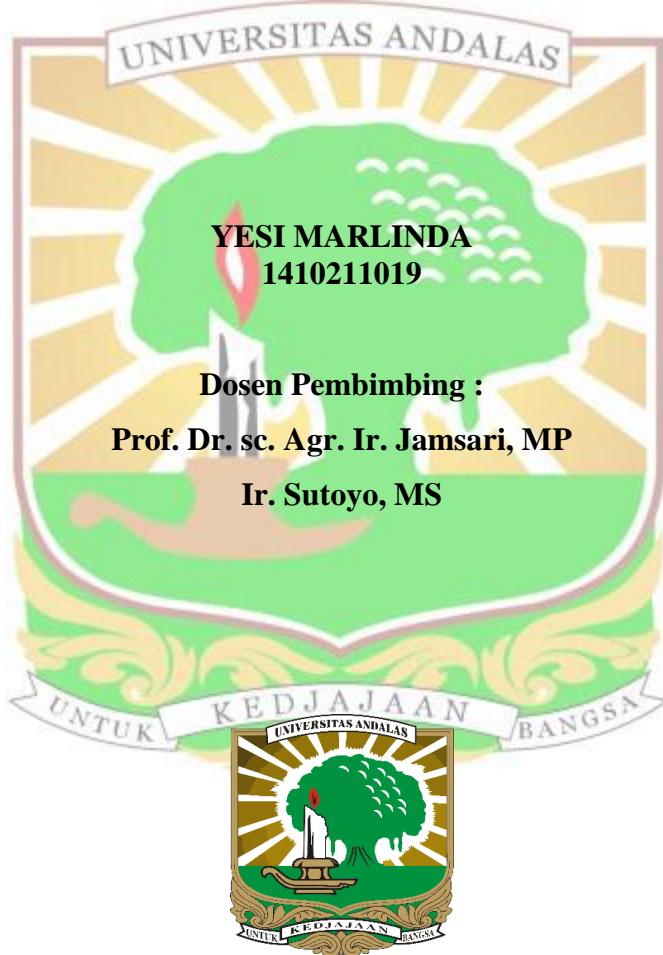


**ISOLASI DAN IDENTIFIKASI PROMOTOR INTI GEN *NPRI*
DARI TANAMAN CABAI (*Capsicum annuum L.*) GENOTIPE
BERANGKAI**

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Abstrak

Protein *NPR1* merupakan regulator utama sistem ketahanan tanaman berbasis *Systemic Acquired Resistance* (SAR) melalui pengaturan ekspresi sejumlah gen ketahanan dengan melibatkan senyawa asam salisilat. Promotor inti gen *NPR1* berlokasi dekat dengan titik awal segmen *Open Reading Frame* (ORF) dan dicirikan dengan adanya sisi *binding site polymerase II* serta memiliki beberapa *Cis-acting element* untuk berinteraksi dengan beberapa faktor transkripsi. Penelitian ini bertujuan untuk mengidentifikasi karakteristik susunan segmen promotor inti gen *NPR1* dari tanaman cabai (*Capsicum annuum* L.) genotipe Berangkai dan keberadaan *Cis-acting element*. Informasi tersebut dapat dijadikan sebagai sumber referensi dalam rangka rekayasa peran gen *NPR1* untuk peningkatan ketahanan tanaman terhadap berbagai cekaman baik biotik maupun abiotik. Penelitian ini berhasil mengisolasi promotor inti gen *NPR1* dengan fragmen yang berukuran 4.050 bp. Fragmen diisolasi menggunakan primer spesifik yang dikombinasikan dengan strategi *primer walking*. Berdasarkan analisis BLASTn, promotor inti gen *NPR1* memiliki tingkat homologi yang sangat tinggi dengan *Zunla-1* yaitu 99 %. Karakterisasi lebih lanjut menggunakan PLACE a Database of Plant *Cis-acting Regulatory DNA Element* mendapatkan berbagai *Cis-acting element* berupa W-box, RAV1AAT, ASF-1, TATA-box, CAAT-box, GARE, GT1, MYB, I-box. Selain itu juga ditemukan adanya elemen *enhancer* berupa CCAAT-box. Penelitian lebih lanjut berupa eksperimen empiris secara *in vitro* dengan cara konstruksi dan analisis fungsional promotor perlu dilakukan untuk menggali lebih jauh fungsi dari masing-masing *Cis-acting element* tersebut.

Kata kunci: *Systemic Acquired Resistance*, *Non-Expressor of Pathogenesis Related 1*, *promotor inti*, *Cis-acting element*, *genotipe Berangkai*

ISOLATION AND IDENTIFICATION THE CORE PROMOTER OF *NPR1* GENES FROM CHILI PEPPER (*Capsicum annuum L.*) GENOTYPE BERANGKAI

Abstract

The *NPR1* protein is a key regulator of plant-based resistant system *Systemic Acquired Resistance* (SAR) by regulating expression of a number of resistance genes involving salicylic acid compound. The core promoter of *NPR1* gene is located close to the starting point of the *Open Reading Frame* (ORF) and is characterized by the presence of *binding site polymerase II* and has several *Cis-acting elements* to interact with several transcription factors. The study aimed to identify the characteristics of the *NPR1* gene and the presence of *Cis-acting element*. This information can be used as a reference source in the framework of engineering of the *NPR1* gene to improve plant resistance against to various biotic and abiotic stresses. This study successfully identified the core promoter of the *NPR1* gene with a 4.050 bp fragment. The fragment was isolated using specific primer combined with a primer walking strategy. BLASTn search analysis indicated that core promoter of the *NPR1* gene sequence is highly conserved with *Zunla-1* which is 99%. Further characterization using PLACE successfully identified various *Cis-acting elements* consisting of W-box, RAV1AAT, ASF-1, TATA-box, CAAT-box, GARE, GT1, MYB, I-box. In addition, an *enhancer* in form of CCAAT-box could also be identified. Further empirical experiments by means of construction and functional analysis of promoters needs to be carried out for further elucidation the functions of each *Cis-acting element*.

Keywords: *Systemic Acquired Resistance, Non-Expressor Pathogenesis Related 1, core promoter, Cis-acting element, genotype Berangkai*

