INTERAKSI MOLEKULER PROTEIN *REPLICASE* GEMINIVIRUS ISOLAT PESISIR SELATAN DENGAN DOMAIN *ANKYRIN-NPR1*

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Abstrak

Mengetahui pengaruh interaksi antra protein *Rep* geminivirus dengan domain *ankyrin NPR1* (*Non-expressor of Pathogenesis-Related Gene* 1) bertujuan untuk memahami bagaimana penekanan ekspresi gen – gen ketahanan pada saat terjadi serangan patogen. Interaksi yang terjadi akan mempengaruhi kerja dari protein *NPR1* sebagai faktor transkripsi. Metoda yang digunakan untuk melakukan uji interaksi yaitu EMSA (*Electrophoretic Mobility Shift Assay*). Perbandingan protein dengan asam nukleat yang digunakan yaitu 7,6 ng/ µL *Rep* x *ankyrin* :100 ng/ µL dan 7,6 ng/ µL Rep x *ankyrin* :5 ng/ µL mampu memvisualisasikan hasil *binding*. Simulasi permodelan dan mutasi protein utuh *NPR1* juga dilakukan untuk memahami dampak dari interaksi yang terjadi. Analisis 3 dimensi protein *NPR1* memiliki posisi *binding* dan pola interaksi yang berbeda dengan protein mutan. Kompleks yang terbentuk antara protein *NPR1* non mutan dengan protein *Rep* memiliki skor *docking* -542,04 sedangkan kompleks antara *NPR1* mutan dengan protein *Rep* memiliki skor *docking* -523,56.

Kata kunci: Geminivirus, *NPR1*, *Ankyrin*, EMSA, *Replicase*

MOLECULAR INTERACTION OF PROTEIN REPLICASE GEMINIVIRUS SOUTH PESISIR ISOLATE WITH DOMAIN ANKYRIN-NPR1

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Abstract

Knowing the effect of geminivirus Rep protein interactions with ankyrin domain NPR1 (*Non-expressor of Pathogenesis-Related Gene* 1) aimed to understand how to suppress gene expression - resistance genes in the event of a pathogen attack. Interactions that occurred will affect the role of the NPR1 protein as a transcription factor. The method used for interaction tests was EMSA (Electrophoretic Mobility Shift Assay). The comparison of proteins with nucleic acids of 7.6 ng / µL Rep x ankyrin: 100 ng / µL and 7.6 ng / µL Rep x ankyrin: 5 ng / µL was able to visualize the bindings. Modeling of interaction with NPR1 protein mutations were also carried out to understand the impact of the interactions. Three-dimensional analysis of NPR1 protein showed binding positions and different interaction patterns with mutant proteins. The complex formed between non mutant NPR1 protein and Rep protein had a docking score of -542.04 and -523.56.

Keywords: Geminivirus, NPR1, *Ankyrin*, EMSA, Replicase