Induksi Respons Pertahanan Tanaman Tembakau (Nicotiana tabacum) oleh Lipopolisakarida Bakteri Pseudomonas syringae pv. tabaci dan Pseudomonas syringae pv. glycinea

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Abstrak

ABSTRAK
Telah dilakukan penelitian yang bertujuan untuk menginduksi respons pertahanan tanaman tembakau oleh lipopolisaakrida (LPS). LPS diekstraksi dari bakteri Pseudomonas syringae pv. tabaci (Pta) dan P. syringae pv. glycinea (Pgl). Respons pertahanan tanaman yang diamati adalah deposisi callose dan ekspresi gen terkait pertahanan (PAL, HIN 1 dan HSR 203J). Untuk pengamatan deposisi callose, daun tembakau diinfiltrasi dengan LPS Pta dan Pgl (400 µg/ml dan 800 µg/ml) serta diinkubasi selama 24 dan 48 jam. Selanjutnya, klorofil daun diluruhkan menggunakan larutan laktofenol dan diwarnai dengan aniline blue. Deposisi callose diamati dibawah mikroskop fluoresensi. Hasil pengamatan menunjukkan LPS bakteri Pgl menginduksi deposisi callose lebih banyak dibandingkan LPS bakteri Pta. Pengamatan ekspresi gen-gen terkait pertahanan dilakukan pada daun tembakau yang diinfiltrasi dengan 400 µg/ml LPS bakteri Pta and Pgl, serta diinkubasi selama 6 jam. Hasil RT-PCR terhadap daun tembakau menunjukkan LPS bakteri Pta dan Pgl mampu menginduksi ekspsresi gen HIN 1, tetapi tidak mampu menginduksi ekspresi gen PAL dan HSR 203J. Gen HIN 1 terekspresi lebih kuat pada daun tembakau yang diinduksi oleh LPS bakteri Pgl daripada LPS Pta. Hasil penelitian mengindikasikan bahwa LPS bakteri Pgl menginduksi respons pertahanan daun tembakau lebih baik daripada LPS bakteri Pta.
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Abstract
The aim of this study is to know the induction of tobacco defense responses by using lipopolysaccharides (LPS) which extracted from two phytopathogen, Pseudomonas syringae pv. tabaci (Pta) and P. syringae pv. glycinea (Pgl). The plant defense responses that observed are callose deposition and expression of defense-related genes (PAL, HIN 1 and HSR 203J). To detect callose deposition, tobacco leaves were infiltrated with 400 µg/ml and 800 µg/ml LPS Pta and Pgl, then incubated for 24 or 48 hr. Tobacco leaves were cleared in lactophenol solution, stained with aniline blue, then visualized by fluorescence microscopy. The result showed that LPS from Pgl induced more callose deposition than that from Pta in tobacco leaves. To investigate defense-related genes expression, tobacco leaves were infiltrated with 400 µg/ml LPS extracted from Pta and Pgl, then incubated for 6 hr. Analysis of defense-related genes

expression were conducted by RT-PCR and visualized by electrophoresis on a 1.8% agarose gel. The result showed LPS Pta and Pgl can induce expression of HIN 1 gene in tobacco leaves, but can not induce the PAL and HSR 203J genes. The HIN 1 gene was highly expressed in tobacco leaves induced by LPS Pgl. The result indicates that tobacco could effectively recognize LPS of nonhost pathogen Pgl but not in host pathogen Pta.