METABOLOMIC OF TOMATO PLANTS DEFENSE RESPONSE TO ROOT-KNOT NEMATODE (*MELOIDOGYNEINCOGNITA*)

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Abstract - Metabolomics allows biochemical markers that have important roles in plant resistance to pests and diseases to be identified and breeders can select plants based on differences in these compounds. This study aimed to find out the metabolite that related to plant defense against the root-knot nematode. Two resistant tomato genotypes, GM2 and F1 (a cross between GM2 x Hawai 7996), and two susceptible (GondolPutih and GondolHijau) were used in this study. Assessing peroxidase activity was measured at 420 nm using a spectrophotometer.^{1}H-NMR (Nuclear magnetic resonance) spectroscopy combined with OPLS-DA (multivariate data analysis) were used to analyze the metabolites involved in the tomato-nematode interactions. Identified signals were semi-quantitively calculated by scaling the intensity of the ^{1}H-NMR to the signals of internal standard (TMSP) at 0.00 ppm.Resistant plants had a significantly higher activity of peroxidase than susceptible plant. The peroxidase activity has constitutiveexpression (in control and inoculated plant) and is one of the defense compounds plant cells produce against pathogens. Metabolitesthat differentiated the susceptible and resistant plants were glucose and caffeic acid. Resistant tomatoes (GM2) observed to have seven times higher level of glucose compared to GondolPutih. Glucose is the primary metabolites that act as signaling pathways in plant defense mechanism and signal indicator of metabolic change in plants. Caffeic acid is one of the phenolic compounds that alleged having the negative effect on nematode activity**.**Peroxidase, glucose and caffeic acidallegedly have an important role to the mechanism of resistance tomato plants to nematodes.

Keywords - Defense, Metabolomic, Tomato, Nematode, Sugar, Caffeic acid.