

## **Induction of peroxidase activity in tomato leaf tissues treated with two crop management systems across a temperature gradient**

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Application of pesticides has been the main method of controlling plant diseases. However, there is a growing interest in developing alternative measures aiming to minimize the harmful impacts of pesticides on the environment and human health. Inducing systemic resistance against plant pathogens is one such environmentally-friendly approach of disease management. The present study was conducted to determine the impact of two crop management practices on peroxidase defense enzyme activity in tomato tissues. Tomato var. *Thilina* was cultivated under two crop management regimes, namely pesticide-based crop management system with recommended pesticide applications and an integrated pest management (IPM)-based system with less reliance on pesticides at five locations (Kilinochchi, Mahailuppallama, Kundasale, Peradeniya and Rahangala) representing a gradient in ambient temperature. Field experiments were conducted during *yala* 2013 using a factorial randomized complete block design. Peroxidase activity was quantified spectrophotometrically using apparently healthy tomato leaf tissues treated with the two regimes and grown at different locations. Findings revealed that there was no significant ( $p=0.05$ ) difference between the two systems on the activity of peroxidase in tomato leaf tissues, indicating the equal efficiency of the IPM treatment on induction of host plant resistance as the crop protection practice relying on more applications of pesticides. The activity of peroxidase in tomato tissues significantly varied ( $p<0.05$ ) among locations. In general, the highest peroxidase activity was recorded at Peradeniya and the lowest was reported at Kilinochchi. There was

no significant relationship between peroxidase activity of tomato tissues and the mean day temperature of the day prior to the sample collection under the two crop management systems. Effect of crop management system on the activity of peroxidase in tomato tissues was significantly influenced ( $p < 0.05$ ) by the location effect.

**Keywords:** Integrated pest management, Peroxidase, Temperature gradient, Tomato.