Detection of Sugarcane Yellow Leaf Virus in the Infected Sugarcane Plant by DAC-ELISA

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ABSTRACT

Sugarcane Yellow Leaf Disease (SCYLD) is a viral disease caused by *Sugarcane Yellow Leaf Virus* (SCYLV) affecting sugarcane and posing a serious threat to the sugarcane cultivation. Management of yellow leaf disease is possible through planting disease-free planting-materials indexed through sensitive diagnostic methods and the development of diagnostic methods helps in detection of SCYLV in asymptomatic plants and suspected plant material. In the present study, polyclonal antibodies against recombinant coat protein were produced for SCYLV and used for detection of the virus in different parts of the infected plant. Using the antibodies, a study regarding the distribution of SCYLV in various tissues and leaves of infected sugarcane plant and plants raised from meristem tip culture were analyzed by DAC-ELISA. The antibodies raised against recombinant coat protein of SCYLV were used at 1:5,000 dilution. Virus distribution in four different tissues of the susceptible variety *i.e.,* 2003V46 (infected and crop developed from meristem tip culture) and a tolerant variety for SCYLV i.e., 97R167 was studied using DAC-ELISA. The samples were taken from 6-8 months old crop. Out of 12 different tissues/ leaf positions tested for SCYLV presence, maximum OD405 values were observed with +1 mid rib leaf samples of infected var. 2003V46 (1.178) followed by the stem sap (0.893), +4 mid rib leaf samples (0.391) and the least in roots (0.083). The SCYLV tolerant var. 97R167 also showed least OD405 values ranging from 0.068-0.093. Virus was also detected in asymptomatic plants raised by meristem tip culture and whose A405 values are twice the negative control. The results from the study clearly demonstrated that higher concentration of SCYLV in midribs of +1 infected leaves as compared to other tissues of plant and hence midrib of +1 suspected leaf may be taken for diagnostic purpose.

Keywords: *Distribution, Sugarcane, DAC-ELISA, Diagnosis and Sugarcane yellow leaf virus.*