# Detection of potato leaf roll virus (PLRV) in tissue culture-derived potato plantlets

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## ABSTRACT

*Meristem tips of diseased potato sprouts naturally infected with potato leaf roll virus (PLRV) were excised and cultured. Regenerated plantlets were vegetatively reproduced by the single nodal cutting method and the resulting segments were cultured for four weeks to produce plantlets with vigour growth. Plantlets were tested for PLRV by enzyme linked immunosorbent assay (ELISA) or reverse transcription-polymerase chain reaction (RT-PCR) and Southern hybridization of the amplified products. Our findings indicated that about 29% and 43% of plantlets were PLRV- infected by serological and molecular methods, respectively. Thus ,ELISA is less sensitive than RT-PCR for the detection of PLRV in tissue culture.*

***Key words*** *: potato, potato leaf roll virus, tissue culture, DAS-ELISA, RT-PCR, Southern hybridization.*

## INTRODUCTION

Potato is among the most economically important crops world-wide. As a member of the *Solanaceae* family, it is highly responsive to many tissue culture techniques. Tissue culture, specifically shoot tip and meristem tip culture, plays an important role in the production of nuclear potato seed stocks and have been applied to free potato from many viruses such as Potato virus X (PVX), Potato virus Y (PVY), Potato leaf roll virus (PLRV), and Potato virus A (PVA) and from Potato spindle tuber viroid (PSTVd) (Facciali and Marani, 1998; Slack and Singh, 1998). Potatoes are susceptible to over twenty-five different virus or virus like-diseases throughout the world (Slack and Singh, 1998). In North America and Egypt, five viruses (PLRV, PVX, PVY, PVA, and potato virus S) and PSTVd are of primary concern and have received attention in potato seed certification programs. Yield reduction in potatoes by PLRV may reach 80-90% in susceptible cultivars, but an even greater loss may be expected when PLRV occurs in simultaneous infection with PVX or PVY (Jayasinghe and Salazar, 1998).

Indicator plants, cytological, serological and nucleic acid-based tests have been utilized to test for potato viruses, including PLRV (Slack and Singh 1998). Enzyme linked immunosorbent assay (ELISA) has been standardized to test for viruses during the last two decades, but nucleic acid-based tests are being evaluated and may be utilized in the future. In this paper, we compared the sensitivity of ELISA with that of reverse transcription –polymerase chain reaction (RT-PCR) for the detection of PLRV in plantlets produced in tissue culture as all seed potato stocks must originate from an *in vitro*