

A Local Lesion Host for Potato Spindle Tuber Virus

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ABSTRACT

Scopolia sinensis leaves produced local lesions when inoculated mechanically with crude sap from tomato leaves infected with potato spindle tuber virus (PSTV). The lesions were dark brown, necrotic, and roughly circular. They appeared in 7 to 10 days in response to the severe strain of PSTV and in 10 to 15 days in response to the mild strain. The *S. sinensis* leaves were suitable for the half-leaf test in estimating virus concentration. Phytopathology 61:1034-1035.

Many new indicator plants for potato spindle tuber virus (PSTV) were recently reported (3, 4), but none was a local lesion host. The lack of a host plant that can be used for quantitative assays of PSTV has been a major obstacle in the study of movement, multiplication, and purification of PSTV. In the past 6 years, over 300 established plant species, varieties, or new introductions have been systematically tested in a search for a quick-reacting, and preferably local-lesion, test plant for PSTV. Except for *Scopolia sinensis* Hemsl. (= *Atropanthe sinensis* Pascher), however, this search has met with limited success. *Scopolia sinensis* reacts to mechanical inoculation with either the mild or the severe strains of PSTV by the production of local lesions.

Scopolia sinensis leaves, when inoculated with crude sap from tomato (*Lycopersicon esculentum* Mill. 'Sheyenne') leaves infected with the severe strain of PSTV (2), developed local lesions in 7 to 10 days. Numerous dark brown, necrotic, and roughly circular lesions (Fig. 1) were formed on true leaves, but only a few lesions developed on cotyledonary leaves. By the 12th to 15th day, systemic veinal necrosis and necrotic spots appeared on new leaves. Leaves with numerous lesions became yellow, necrotic, and dropped off. Local lesions and systemic necrotic spotting were produced by both strains of PSTV, but lesions produced by the mild strain first appeared in 10 to 15 days, which was several days later than was observed for the severe strain.

Two tests were made to determine if half-leaves of *S. sinensis* were suitable for estimating relative virus concentration. Plants grown at 25 C in a greenhouse and provided supplemental lighting were used when they were at the four- to five-leaf stage and growing vigorously. An incomplete block design was employed

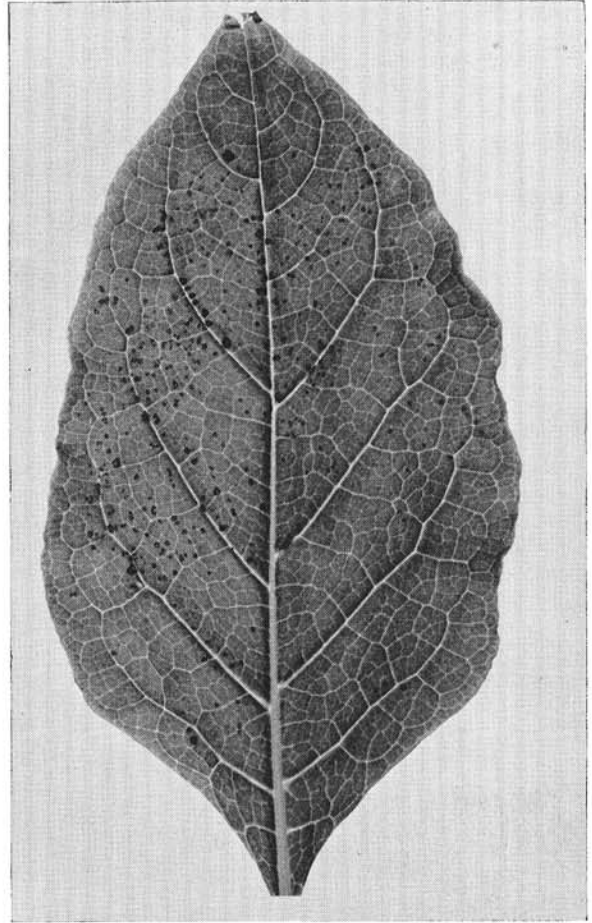


Fig. 1. *Scopolia sinensis* leaf showing local lesions caused by potato spindle tuber virus severe strain.

to effect random distribution of the different inocula to the various test leaves. Each inoculum was tested 4 times at each leaf level. The average number of lesions from eight half-leaves was 77 and 111, 46, 8, and 1 for undiluted crude sap and four serial tenfold dilutions, respectively. Thus, *S. sinensis* appears to be as susceptible to diluted crude sap as is tomato (1), and except for the first dilution, a decrease in lesion number followed each dilution. The value obtained for the first dilution may reflect increased activity of an inhibitory factor made more available by dilution.

Individual lesions, excised from the half-leaves inoculated with a 10^{-3} dilution of severe PSTV infective sap, were triturated in a small volume of phosphate buffer and inoculated onto tomato leaves. Typical severe PSTV symptoms were produced in all the plants.

No symptoms were produced in *S. sinensis* plants inoculated individually with crude sap containing potato viruses M, S, X, or Y; however, viruses M, S, and X, but not Y, were recovered from inoculated plants.

Thus, *S. sinensis* appears to be a suitable host plant for PSTV for the following reasons: It forms local le-

sion in response to both mild (1) and severe strains; symptoms are produced earlier than on tomato; no symptoms are produced by other potato viruses which sometimes complicate the symptomology in tomato; and local lesions also are produced in detached leaves maintained on nutrient solution, which makes possible indexing of a large number of potato plants in limited space.

Seeds of *S. sinensis*, a member of the family *Solanaceae*, were obtained from the Botanic Garden of the University, Leiden, The Netherlands. Plants are obtained readily from either cuttings or seed, and reach the four-leaf stage in 4-5 weeks. Moreover, the

plants remain susceptible up to the 10- to 12-leaf stage; and top leaves are more susceptible than bottom ones.

LITERATURE CITED

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