

BRIEF COMMUNICATION

Some Pea Cultivars as Local Lesion Hosts for Potato Virus X

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Abstract. Sixteen *Pisum sativum* cultivars were mechanically inoculated with two isolates of PVX. Distinct necrotic local lesions on the inoculated leaves were found in six cultivars 5 to 6 days after inoculation. The best results were obtained with the Meteor and Raman cultivars, 17 to 23 days old.

Gomphrena globosa, *Capsicum annuum* and *Cassia occidentalis* are the best known local-lesion hosts of potato virus X (DE BOKX 1972). Recently some authors have stated (e.g. FRIBOURG and DE ZOETEN 1975) that some genera of the family *Leguminosae* (*Papilionaceae*) produced local symptoms; DE BOKX and JANSE (1977) and AGUR (1978) first indicated that also some cultivars of *Pisum sativum* developed local lesions when inoculated with PVX.

The susceptibility of sixteen pea cultivars was tested in the present paper (Table 1). Two isolates of PVX were used: X₁ — obtained from potato cultivar Krasava and X₂ — obtained from potato clone A6. PVX isolates were maintained on *Nicotiana tabacum* cv. Samsun. The cultivars of *Pisum sativum* were grown in a greenhouse. The test plants were inoculated using glass spatula and carborundum on the 20th and 30th day after planting. Inoculum was prepared by grinding leaves of infected tobacco and diluting the crude sap 1 : 3 with distilled water. 10—12 plants of each pea cultivar were used for inoculation with PVX, the second set of plants were inoculated in the same way with the sap of healthy *N. tabacum*. The temperature in the greenhouse during the experiments ranged from 15 to 22 °C. From inoculated plants (separately from inoculated and non-inoculated leaves) back inoculations were made to *N. tabacum* cv. Samsun.

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TABLE 1

Reaction of *Pisum sativum* cultivars to inoculation of PVX

Cultivars	Inoculation I		Inoculation II	
	PVX isolates			
	X ₁	X ₂	X ₁	X ₂
Borek	0	0	0	0
Dalibor	0	0	0	0
Dukát	(LN)	0	(LN)	0
Jupiter	0	(LN)	0	0
Meteor	LN	LN	LN	LN
Orion	LN	LN	(LN)	0
Proteus	LN	LN	(LN)	(LN)
Raman	LN	LN	LN	LN
Smaragd	LN	(LN)	LN	0
Facima	0	0	0	0
Lancet	(LN)	(LN)	(LN)	0
Minarette	0	0	0	0
Mingomark	(LN)	0	0	0
Ofélia	LN	(LN)	LN	0
Sprinter	(LN)	(LN)	(LN)	0
Superior	(LN)	(LN)	(LN)	0

Inoculation: I — 20 days after sowing; II — 30 days after sowing.

Symptoms on inoculated leaves: 0 — no symptoms

(LN) — very weak local necrosis

LN — distinct local necrotic lesions

Table 1 shows the results obtained with 16 cultivars inoculated. No symptoms of infection with PVX were observed with four cultivars, very weak symptoms unsuitable for evaluation were observed with six pea cultivars. The other pea cultivars, *i.e.* Meteor, Orion, Proteus, Raman, Smaragd and Ofélia, reacted with distinct local necrosis. The dark brown lesions with a diameter of 0.3–0.6 mm appeared on the 5th to 6th day after inoculation (Fig. 1). Between the cultivars investigated some differences were noted *e.g.* in the number of necrotic spots on inoculated leaves as well as in their reaction with both isolates of PVX. The best results were obtained with cultivars Meteor and Raman. No systemic reactions of *Pisum sativum* plants were observed (with all cultivars tested), and PVX could not be isolated from the young non-inoculated leaves. However, PVX was easily detected in inoculated leaves of the cultivars showing local lesions.

To determine the effect of age of test plants on the sensitivity of the bioassay, sets of *Pisum sativum* cultivars Meteor and Raman of different ages were inoculated with X₁ isolate. 16–20 leaves were used for inoculation of each set of plants being 12, 17, 23, 49 and 57 days old. Fig. 2 shows the relation between the average local lesion numbers produced per leaf of each cultivar and different ages of pea plants on the day of inoculation. The two cultivars reacted in the same way. The highest average numbers of necrotic lesions were obtained with 17–23 day-old plants, which remained susceptible to PVX for a relatively long time.

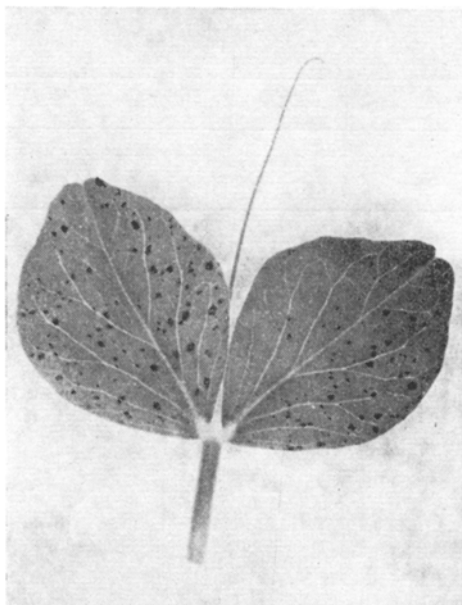


Fig. 1. Leaves of *Pisum sativum* L. cv. Meteor showing local lesions induced by potato virus X (isolate X₁) 8 days after inoculation.

Though it is necessary to prove other factors which qualify the necrotic reaction of inoculated *Pisum sativum* leaves, we can conclude that some of the cultivars (according to our experiments namely Meteor and Raman) might be useful bioassay hosts for PVX. Compared with the other local lesion hosts of PVX, plants of *Pisum sativum* can be produced quickly, and need less space: paired leaflets make these plants also suitable for an estimate of the PVX concentration (Agur 1978). DE BOXX and JANSE (1977) in addition confirmed that both of their *Pisum sativum* cultivars reacted similarly to all PVX isolates tested.

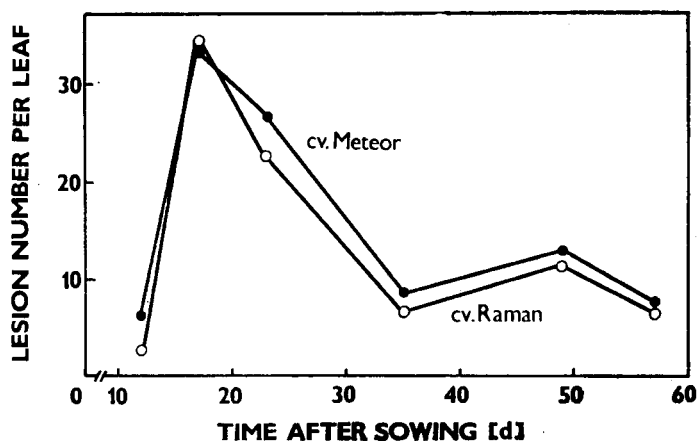


Fig. 2. Numbers of local lesions obtained in *Pisum sativum* of different ages inoculated with PVX (isolate X₁). 16–20 leaves were used for each group and cultivar.

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BOOK REVIEW

NAGL, W.: CHROMOSOMEN. ORGANISATION, FUNKTION UND EVOLUTION DES CHROMATINS. — Verlag Paul Parey, Berlin–Hamburg 1980. 228 S., DM 29,—.

In den letzten Jahren kam es zu einem noch nie dagewesenen Fortschritt auf dem Gebiet der Zellbiologie, besonders was die Chromosomen betrifft. Die Ursache dafür liegt in der Anwendung molekularbiologischer Methoden und ihrer Verknüpfung mit den Resultaten der Elektronen- und Lichtmikroskopie. Das grosse Interesse für das Studium der Organisation und Funktion der Chromosomen hat ihren Ursprung darin, dass die Chromosomen die genetischen Kode beinhalten und dass sie zur identischen Reduplikation und zur Weitergabe des genetischen Materials an ihre Töchterchromosomen fähig sind. In diesem Buch werden vor allem die Chromosomen der Eukaryonten behandelt, doch wird auch auf auffallende Unterschiede zu den Bakterienchromosomen hingewiesen.

Im einleitenden Kapitel des Buches werden die allgemeinen Eigenschaften der Chromosomen kurz beschrieben (Zahl, Grösse, Längsdifferenzierung, Chromosomenbänder usw.). Die weiteren Kapitel enthalten: Molekulare und ultrastrukturelle Organisation (2), Funktionelle Organisation und Genexpression (3), DNA-Replikation und Zellzyklen (4), Chromosomen-Genetik (5) und Evolution der Chromosomen (6). Im letzten Kapitel (7): Präparationsmethoden und Manipulation wird eine Übersicht über die Prinzipien der Chromosomenforschung angeführt. Es handelt sich um Licht und Elektronenmikroskopie, Autoradiographie, Szintillationszählung, Zentrifugationsmethoden, Denaturierung und Renaturierung der DNA, Zellkulturen und Zellhybridisierung.

Mit dem vorliegenden Buch (2., neubearbeitete und erweiterte Auflage) wird die Reihe "Pareys Studententexte" als 23. Band fortgeführt. In erster Linie wendet sich dieses Buch an fortgeschrittene Studenten der Biologie sowie an Wissenschaftler, die sich über dieses Teilgebiet der Genetik informieren möchten.

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