Seed Transmission of Broad Bean Stain Virus in the Wild Legume Vicia palaestina Boiss

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Abstract

Seed-transmissibility of broad bean stain virus (BBSV) was investigated in a number of wild legume species. Germinating axes of seeds collected from BBSV-infected plants were tested by the enzyme-linked immunosorbent assay (ELISA). The virus was found to be seed-transmitted in *Vicia palaestina*.

Introduction

In a recent study Makkouk *et al.* (1987) indicated that a number of wild legumes naturally occurring in Syria are susceptible to BBSV infection. The importance of these species as potential reservoirs and sources of virus inoculum in the field is, however, increased if the virus is also seed-transmissible. The purpose of this study was to investigate whether or not the virus is transmitted in the seeds of these species.

Materials and Methods

Seeds from forty-four wild leguminous spp. naturally occurring in Syria were collected by the Genetic Resources Program of ICARDA. Of these species, 11 were found to be susceptible to BBSV infection in a previous study (Makkouk *et al.* 1987) and they were included in this work (Table 1).

Using three pots per species, 5-10 seeds were sown per pot and kept in the glasshouse. Three to four weeks after sowing, plants were mechanically inoculated with a BBSV isolate from Syria (SV 173-85). For each species, one pot was left uninoculated and served as the healthy control. After maturity, seeds from infected and healthy plants were collected and replanted in sterilized sand. The germinated seedlings (7-10 days after sowing) were then tested for the presence of BBSV by ELISA. The BBSV anti-serum used in the test was produced earlier in our laboratory. Seedlings were tested in groups, depending on the number of seeds available for each species.

Results and Discussion

Table 1 shows that among the 11 species tested, BBSV was found to be seed-borne only in *V. palaestina* (Fig. 1). It cannot be concluded, however, that BBSV is not seed-borne in all the other species tested because the number of seeds tested in some of them was very low. Seed production of BBSV-inoculated plants of some of the species such as *M. constricta*, *T. nigriscens*, *T. resupinatum*, and *T. subterraneum* was very low under glasshouse conditions.

Table 1. Detection of broad bean stain virus by ELISA[a] in germinating embryo axes of seeds collected from BBSV-infected wild leguminous species.

Plant species	Total number of seeds tested	Number of groups	Number of infected groups
Medicago arabica (L.) Huds.	112	11	0
M. constricta Dur.	8	1	0
M. polymorpha var. brevispina L.	28	3	0
Trifolium lappaceum L.	252	25	0
T. nigriscens Viv.	5	1	0
T. resupinatum L.	4	1	0
T. subterraneum L.	3	1	0
T. spumosum L.	150	15	0
T. tomentosum L.	21	3	0
Trigonella arabica Del.	50	5	0
Vicia palaestina Boiss.	29	3	2

[a] Values higher than those of the healthy mean plus five standard deviations were considered positive.

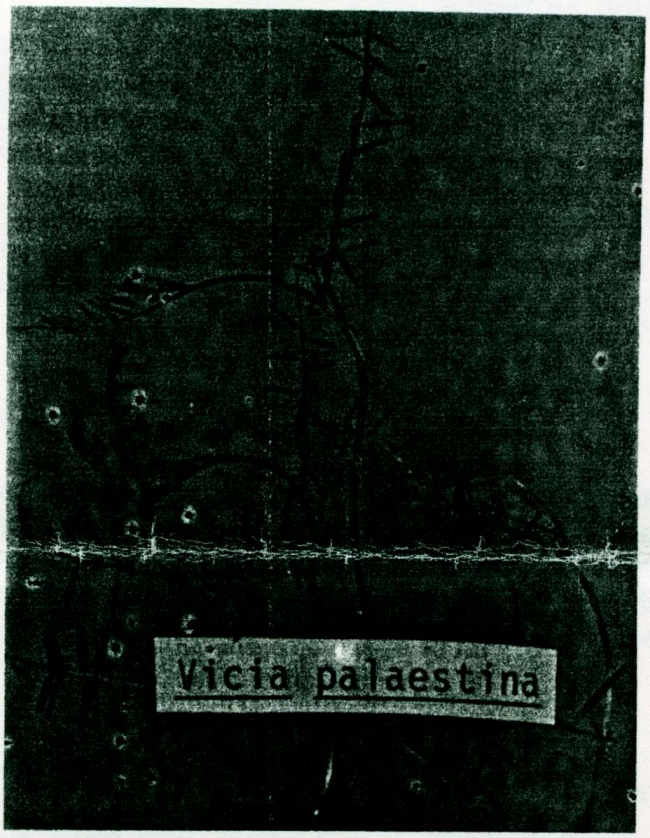

Fig. 1. *Vicia palaestina.*

All the wild legumes listed in Table 1 can play the role of BBSV reservoir in nature. Infection can spread from these species to susceptible crops such as faba beans, lentils, peas, french bean, etc. through weevil vectors (Cockbain *et al.* 1975). However, since most of these species are annual winter legumes they cannot increase the chances of BBSV survival over the dry hot summers unless the virus is seed-borne. This characteristic permits the virus to perenate. Since BBSV was found to be seed-borne in *V. palaestina*, this wild legume can, therefore, play an important role in the ecology of the virus. *V. palaestina*, known locally as "Kirsannah-barri", is a morphologically variable wild leguminous species naturally present in the East Mediterranean region including Turkey, Syria, Lebanon, Jordan, and Cyprus (Davis 1970; Post 1932). This is the first report of seed-transmissibility of BBSV in *V. palaestina.*

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Inhibition of Botrytis fabae in the Phyllosphere of Vicia faba Leaves

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Abstract

***In-vitro* studies on *Botrytis fabae* - *Vicia faba* interactions indicated the presence of a strong inhibitory phyllosphere effect on the pathogen before penetration into leaf tissue. Washings from leaflets of the resistant faba bean lines BPL 1179 and 710 significantly suppressed spore germination and germ-tube elongation of *B. fabae*, compared to those from leaflets of the susceptible line R-40. Additional work is needed to differentiate between the effects of epiphytic microorganisms and those of leaflet diffusates on *B. fabae*. These investigations should help in the identification of new mechanisms of resistance to the pathogen.**

Introduction

Studies on host-pathogen interactions have indicated that the invasion of faba bean cells by *Botrytis fabae*