OCCURRENCE OF CUCUMBER MOSAIC VIRUS ON BUDDLEIA DAVIDII IN YUGOSLAVIA

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In the surroundings of Sarajevo symptoms were observed of a virus disease on ornamental shrubs of B. davidii Franch. Cucumber mosaic virus (CMV) was isolated and identified from diseased plants. The identification was performed on the basis of reaction of test plants and positive results of serological double diffusion test in agar gel. This is the first find of CMV in B. davidii in Yugoslavia.

Introduction

B. davidii is an ornamental shrub which derives from East Asia. This decorative shrub has graceful and flavoured inflorescences and is very common on green areas, parks and gardens (Vukićević 1974).

In the past years we observed that B. davidii plants in the parks of Sarajevo had obvious symptoms of virus infection on the leaves.

When we looked for information about Buddleia, we found two publications as very useful. The first was a book by Cooper (1979), in which we found that B. davidii plants are often infected with CMV in various countries. The second paper was written by Miličić (1982). From this second paper we learned that none of the virus diseases on Buddleia had been described or found in Yugoslavia till now. Therefore, we decided to investigate the diseased shrubs of B. davidii.
Material and Methods

Material

Leaves of diseased *B. davidii* showed marked symptoms in the form of green-yellow mosaic, variegation, narrowing of leaf blade and even the shoe-string symptoms (Fig. 1 A and B). The shrubs became considerably stunted.

Virus from *B. davidii* was mechanically transmitted to *Chenopodium quinoa* Willd. using 0.67 M phosphate buffer pH 7.3 containing 0.14% thioglycolic acid as a grinding medium and carborundum as abrasive. From *C. quinoa* the virus was transmitted to other test plants.

Methods

Serological tests were performed by double diffusion method in 0.9% Bacto-agar gel containing 0.05% NaN₃. The source of the virus for serological reaction was the crude sap from infected leaves of *Nicotiana tabacum*. For these tests immune serum against CMV with the titre of 1:128 was used. The serum contained antibodies against normal proteins and, therefore, it was previously saturated with the healthy sap of tobacco or diluted to the titre 1:16. This serum prepared against CMV-Car strain was sent us kindly by Dr. E. Luisoni (Torino).

Results

Host range

**Chenopodiaceae**

*Chenopodium murale* L. Three days after inoculation a large number of necrotic local lesions appeared. The lesions were surrounded by a chlorotic halo.

*C. quinoa* Willd. Yellowish lesions with a diameter of about 2 mm appeared on inoculated leaves. The infection was local.

**Cucurbitaceae**

*Cucumis sativus* L. Systemic reaction with a characteristic yellow-green mosaic.

**Solanaceae**

*Datura stramonium* L. Systemic infection. Yellow-green mosaic. Dark green blade regions with bladder-like convex protuberances. Deformations and shoe-string anomalies of leaf blade. Growth was stunted (Fig. 2 A).

*Nicotiana tabacum* L. Samsun and White Burley. Systemic infection. Yellow-green mosaic, stagnation of vein development. Some dark green leaf parts were locally inflated (Fig. 2 B). Old leaves were yellow with dark green patches.

Reactions of test plants *C. quinoa* and *Datura stramonium* were especially characteristic of infection with CMV (cf. Gibbs and Harrison 1970).

Serology

The infective sap reacted with the immune serum against CMV in serological double diffusion test in agar gel (Fig. 2 C). Therefore, we can consider that the shrubs *B. davidii* have been infected with CMV.
Fig. 1. A. Symptoms on naturally infected *Buddleia davidii* shrub: mosaic, leaf deformation, narrowing of leaf lamina and shoe-string symptom; B. Infected leaf of *B. davidii* (detail).

Fig. 2. A. Various symptoms of CMV isolate from Buddleia on Datura stramonium; B. Systemic symptoms on Nicotiana tabacum cv. Samsun. C. Serological double diffusion test between CMV isolate investigated and the serum against CMV-Car (central well). The peripheral wells contain the virus crude sap (v) and healthy sap as control (k). The precipitation lines appeared between peripheral wells containing antigen and the central well.
Discussion

According to the data of Miličić (1982) CMV is the most frequent virus attacking woody plants in Yugoslavia. This effectiveness is due to the fact that CMV has very efficient vectors which transmit CMV from herbaceous plants to various shrubs and trees.


As follows from the data in this paper, CMV often attacks B. davidii in the surroundings of Sarajevo. It is necessary to point out that B. davidii is also infected by CMV in many other countries. Shrubs of B. davidii were found infected with CMV in England (Smith 1952), the Netherlands (Bouwm ann and Noord am 1955), Germany (Schmelzer and Schmidt 1968) and France (Signoret 1969). Van Hoof and Carron (1975) isolated not only CMV but also strawberry latent ringspot virus from Buddleia.

Shrubs and trees infected with CMV represent reservoirs of infection in nature (Schmelzer 1969). This author studied especially the shrubs of Lycium halimifolium which were infected with CMV. Pleše and Miličić (1974) confirmed the finds of Schmelzer (1969). It is also very probable that many other shrubs can be a reservoir of CMV in nature.

References


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SADRŽAJ

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