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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 (Vukičević 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% NaN_3. 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 nm 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.

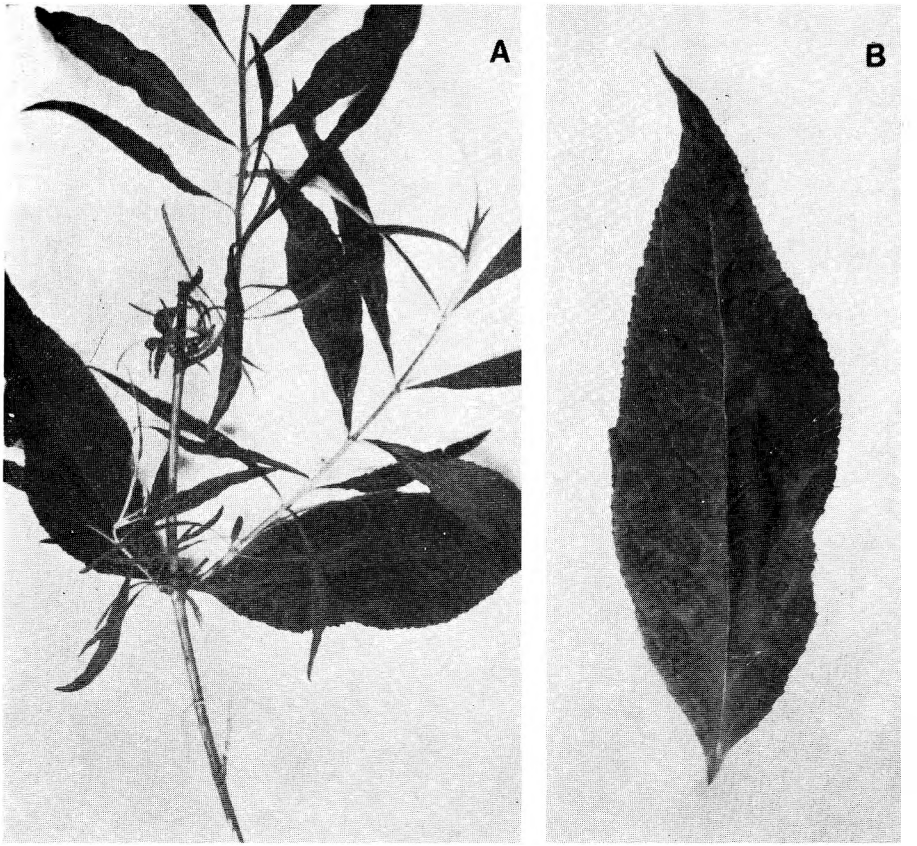

Fig. 1. A. Symptoms on naturally infected *Buddleia davidii* shrub: mosaic, leaf deformation, narrowing of leaf lamina and shoe-string symptom; B. Infected leaf of *B. davidii* (detail).

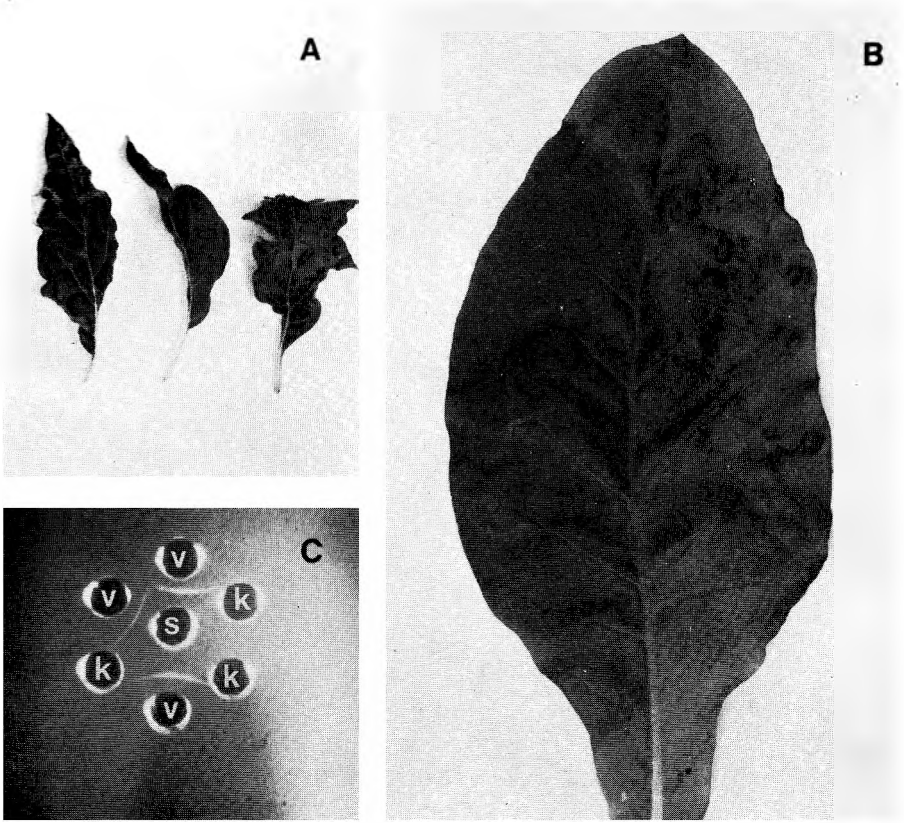

Fig. 2. A. Various symptoms of CMV isolate from *Buddleia* on *Datura stramonium;* B. Systemic symptoms on *Nicotiana tabacum* cv. Samsun. C. Serological double diffusion test between CMV isolate investigated and the serum against CMV-Car (central well). The peripheral wells contain the virus crude sap (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.

On the basis of data by Miličić (1982) CMV has been isolated till now from many woody plants in Yugoslavia. Horváth et al. (1975) found CMV in *Aristolochia macrophylla* Lam., Pleše and Miličić (1974) found CMV in *Forsythia suspensa* (Thunb.) Vahl. and *Lycium halimifolium* Mill., Mamula et al. (1977) discovered CMV in *Leycesteria formosa* Wall., Pleše and Miličić (1974) established it in *Maclura pomifera* and Pleše and Wrischer (1984) found it in *Passiflora caerulea* L.

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 (Bouwmann and Noordam 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.

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SADRŽAJ

NALAZ VIRUSA MOZAIKA KRASTAVCA U VRSTI *BUDDLEIA DAVIDII* U JUGOSLAVIJI

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U godinama 1983. i 1984. zapazili smo u parkovima Sarajeva velik broj ukrasnih grmova vrste *Buddleia davidii* Franch., koji su imali virusne simptome. Virus je iz spomenutog domaćina prenesen mehaničkom inokulacijom na veći broj zeljastih pokusnih biljaka. Simptomi na izvornim grmovima i na pokusnim biljkama ukazivali su da se vjerojatno radi o infekciji virusom mozaika krastavca (cucumber mosaic virus). Seroloćkim je pokusima u agarskom gelu potvrđeno da se stvarno radi o tom virusu. Prema tome virus mozaika krastavca napada ukrasne grmove vrste *B. davidii* na području Jugoslavije. Vjerojatno je da se iz bolesnih grmova virus širi s pomoću afida na zeljaste biljke tako da bolesni grmovi predstavljaju izvor zaraze u prirodi.

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