

A GRAFT TRANSMISSIBLE AGENT FROM THE
NON-VARIEGATED *PITTOSPORUM TOBIRA*
(THUNB.) AIT

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Introduction

Pittosporum tobira is an endemic plant in China and Japan, and it can be found in the open field under the mild Mediterranean climate. Little is known about its pathogens and diseases. Only a few fungal pathogens have been described from this host plant: *Rhizoctonia ramicola* Weber et Roberts (Weber and Roberts 1951), *Alternaria tenuissima* (Fr.) Wiltshire (Sobers 1964), *Gibberella fujikuroi* (Saw.) Wr. (Treggi 1964). In the USA and Italy *Pittosporum* variegation virus (Brierley 1944) and *Pittosporum* vein clearing virus (Corte 1957) were successfully isolated from *Pittosporum tobira*.

A couple of years ago, during my summer holiday, which I spent in the surroundings of Dubrovnik, a characteristic disease of the non-variegated *Pittosporum tobira* called my attention. Results of preliminary studies on the nature of this disease are presented in this paper.

Material and Methods

As the first step of the demonstration of infectious nature of the disease, mechanical transmissions were carried out to the following testplants: *Chenopodium amaranticolor* Coste et Reyn., *Chenopodium quinoa* Willd., *Datura metel* L., *Datura stramonium* L., *Nicotiana rustica* L., and *Nicotiana tabacum* L. cv. Samsun. *Pittosporum tobira* leaves showing characteristic symptoms were cut in small pieces, excluding veins, and were ground with 400 mesh carborundum in 0,1M phosphate buffer at pH 7.0. To get the plant juice, this macerated tissue was filtered through a fine sterile cheese cloth.

In addition to the mechanical transfers, bark graftings were carried out, too. During these experiments, shoots obtained from diseased *Pittosporum tobira* were grafted onto healthy *Pittosporum* plants.

Results and Conclusions

All mechanical transfers to test plants gave negative results. The pathogen, however, was successfully transmitted to healthy plants by means of bark graftings. Dendritic-like vein clearing occurred on the leaves of the infected plants, and in certain cases interveinal yellow and chlorotic spots developed (Fig. 1.). Leaf roll developed frequently on the diseased plants. As a consequence of the infection, strong rosette formation, and in many cases leaf deformation occurred on the terminal leaves (Fig. 2.). Leaves in general remained narrow and weakly developed. This, symptomatologically very prominent disease of *Pittosporum tobira*, which was observed for the first time in Yugoslavia, certainly differs from the latent disease of *Pittosporum crassifolium* caused by alfalfa dwarf virus (syn.: Grapevine Pierce's disease virus), under artificial conditions.

Alfalfa dwarf virus, a virus transmitted by means of leafhoppers (e. g. *Draeculacephala minerva* Ball., *Hordnia circellata* Baker, *Carneoccephala fulgida* Nott.) to *Pittosporum crassifolium* by Freitag (1951), caused no symptoms, although this plant proved to be an important symptomless host of the virus. No data are available concerning the spontaneous, natural occurrence of alfalfa dwarf virus (mycoplasma ?) on *Pittosporum* species.

On the ground of recent results obtained during mycoplasma studies (cf. Doi et al. 1967; Ishiie et al. 1967; and reviewed by Casper 1969; Whitcomb and Davis 1970; Bos 1970; Horváth 1970, 1972; Maramorosch et al. 1970; Hull 1971; Davis and Whitcomb 1971; Kleinhempel et al. 1971), it seems most probable that alfalfa dwarf is actually a mycoplasma disease.

This graft transmissible pathogen, which was isolated by us from *Pittosporum tobira* is at least symptomatologically very similar to the *Pittosporum* vein clearing virus, described by Corte (1957).

The possible role and the identification of the leafhoppers vectors are under investigation since the presence of a large number of these insects has been observed on diseased *Pittosporum tobira* plants.

Further studies are required in order to prove, or disprove the identity of our *Pittosporum* dendritic yellowing disease with *Pittosporum variegation* (Brierley 1944) and/or *Pittosporum* vein clearing (Corte 1957) virus diseases. Another question to be answered is whether all these diseases of *Pittosporum* are caused by viruses or by mycoplasma pathogens.

Fig. 1. Healthy (A) and diseased leaf (B) of *Pittosporum tobira*. Dendritic vein yellowing symptoms are well visible.

Sl. 1. Zdravi (A) i oboljeli list (B) vrste *Pittosporum tobira*. Vide se simptomi dendritičkog žućenja žila.

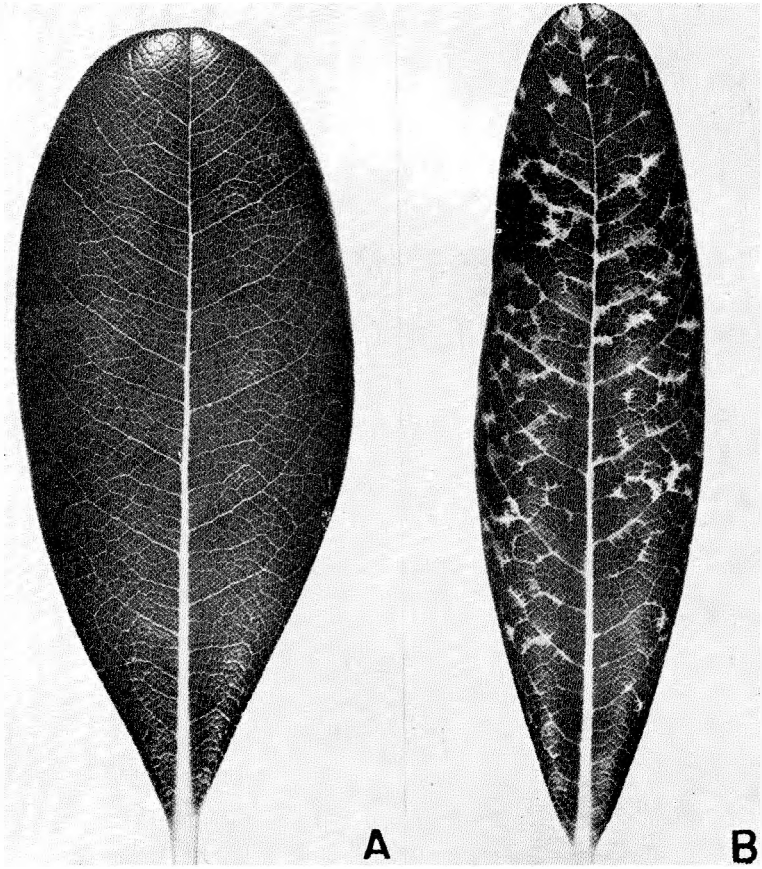


Fig. 1. — Sl. 1.

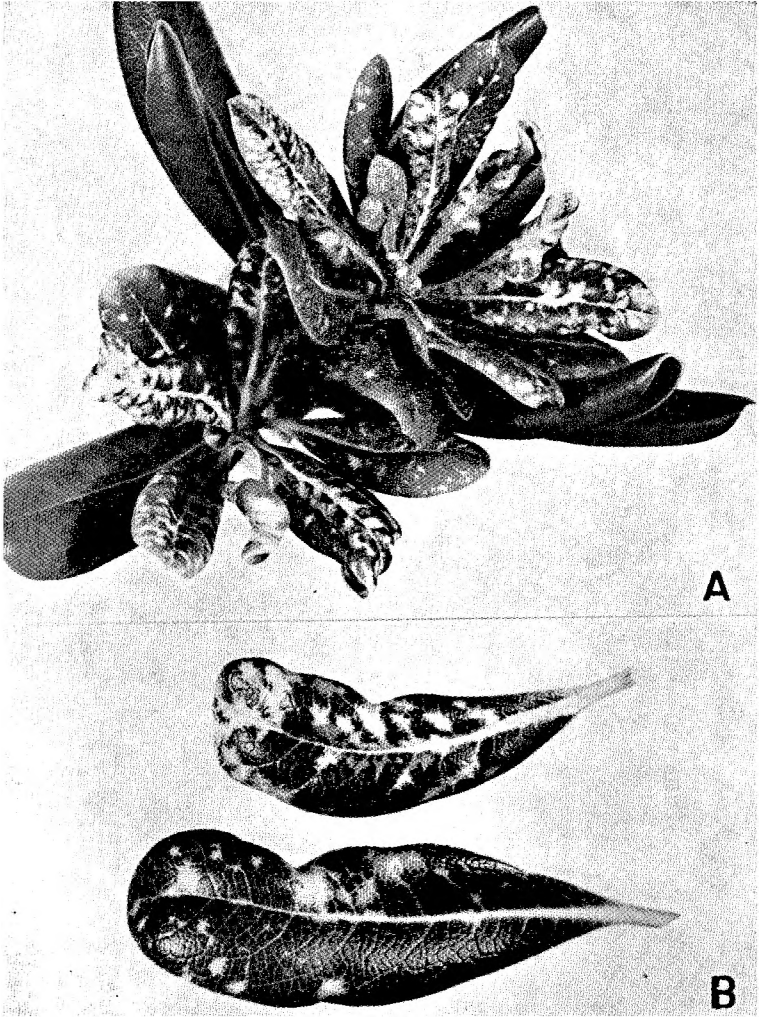


Fig. 2. — Sl. 2.

Summary

A pathogen, transmissible by means of bark grafting, has been isolated from *Pittosporum tobira* plants showing dendritic-like vein clearing, yellowish chlorotic spots, leaf roll, terminal rosettes and leaf deformation symptoms. The material has been found and collected around Dubrovnik and the Peninsula of Lapad at the Yugoslav seashore. This disease is somewhat similar symptomatologically to the vein clearing virus disease of *Pittosporum*. Nevertheless, the pathogen isolated by us could not be transmitted mechanically.

Further investigations are required in order to solve the question of whether *Pittosporum* vein clearing disease, *Pittosporum* variegation disease, and *Pittosporum* dendritic vein yellowing disease — a name proposed for the disease described here — are caused by the same pathogen, and to establish the virus or mycoplasma nature of these pathogens. According to our preliminary observations, leafhopper species (not yet identified), which occur on *Pittosporum tobira* in a large number, play a possible role in the spread and distribution of the pathogen. Main aims of further investigations in this field are the identification of possible insect vectors, determination of mode of transmission of the pathogen, as well as host range studies.

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Fig. 2. Symptoms of dendritic vein yellowing disease on *Pittosporum tobira* twig (A) and leaves (B).

Sl. 2. Simptomi bolesti dendritičkog žućenja žila na grančici biljke *Pittosporum tobira* (A) i na listovima (B).

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S A D R Ž A J

AGENS KOJI JE IZOLIRAN CIJEPLJENJEM IZ PITOSPORA
(*PITOSPORUM TOBIRA* (THUNB.) AIT) BEZ PANASIRE

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Pomoću cijepjenja korom izoliran je iz vrste *Pittosporum tobira* patogeni agens koji je na toj biljci uzrokovao simptome u obliku prosvjetljivanja žila nalik na dendrite, žučkastih klorotičnih pjega, uvijanja lista, stvaranja vršnih rozeta i deformacija lista. Materijal je sakupljen na obali oko Dubrovnika i poluotoka Lapada. Ta bolest, koju sam ovdje opisao, po simptomima ponešto nalikuje na virusnu bolest prosvjetljivanja žila pitospora, proučenu i opisanu već ranije (Corte 1957). Međutim, patogeni agens nismo mogli prenijeti mehaničkom inokulacijom. Potrebna su daljnja istraživanja da se riješi pitanje da li isti uzročnik izaziva bolest prosvjetljivanja žila pitospora, bolest šarenila pitospora (Brierley 1944) i bolest dendritskog žućenja žila pitospora. Posljednji naziv predlažem za bolest koju sam ovdje opisao. Isto tako trebalo bi raščistiti pitanje da li je uzročnik virus ili mikoplazma. Prema mojim prethodnim istraživanjima na širenje uzročnika vjerojatno utječu neke vrste cvrčaka; te vrste nisu još identificirane, a vrlo su česte na pitosporu.

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