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INSTITUT ZA ZAŠTITU BILJA I ŽIVOTNU SREDINU - BEOGRAD
INSTITUTE FOR PLANT PROTECTION AND ENVIRONMENT - BELGRADE

# ZAŠTITA BILJA
# PLANT PROTECTION

VOL. 49(2),N$^{O}$224, 1998.

CONTENTS

# HISTORY OF SCIENCE DEVELOPMENT ON PLANT PATHOGENIC BACTERIA IN THE FEDERAL REPUBLIC OF YUGOSLAVIA (1934-1998)

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## Summary

**A review of 64 years of Phytobacteriology development in the Federal Republic of Yugoslavia has been given. The data on genesis and advancement of phytobacteriological investigations at the Faculties of Agriculture in Belgrade/Zemun/ and Novi Sad have been explained. This period (1934-1998) was divided into five stages: the first one, from 1934-1952, the second, from 1952-1964, the third, from 1964-1980, the fourth, from 1980-1994 and the fifth, from 1994 onwards.**

**After that, teaching activity, carried out under the title "*Bacterial Plant Diseasas*" to the students of plant protection course at the Faculties of Agriculture in Zemun and Novi Sad, is presented.**

**In the course of past 64 years, nearly 300 scientific and professional papers (Arsenijević et al., 1971; Arsenijević and Jovanović Olivera, 1991; Vasiljević, 1991) have been published, six doctorial dissertations and twelve master thesis defended and about two hundred diploma works elaborated.**

From the Phytobacteriology field, three handbooks (Tešić, 1949; Šutić and Panić, 1969; Arsenijević, 1992a) have been published, two notes from lectures for students of the plant protection course (Nikolić, 1964; Šutić, 1965, 1976) and three editions of the university textbook under the title "*Bacterial Plant Diseases*" (Arsenijević, 1975, 1988, 1997).

**Besides, a monograph about *Erwinia amylovora* pathogen /"Fire blight of [fruit] trees and ornamental plants – *Erwinia amylovora* – "; Panić and Arsenijević, 1996/ has been published, too.**

***Key words*: Phytobacteriology; history of the development; Yugoslavia; Plant pathogenic bacteria; experimental investigations; teaching; editorial activity; phytobacteriologists; Faculty of Agriculture.**

***(Received: October 24, 1998)***
***(Accepted: March 4, 1999)***

BACTERIOLOGICAL CHARACTERISTICS OF THE *ERWINIA AMYLOVORA* (BURRILL) WINSLOW ET AL. STRAINS OF VARIOUS ORIGIN

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Summary

Pathogenic, cultural and biochemical-physiological characteristics of the *Erwinia amylovora* strains originating from different hosts and localities in Yugoslavia and in the world (Canada, England, Germany, Greece and Iran) were investigated. The aim of this study was to prove their similarities and differences on the basis of the bacteriological characteristics and pathogenicity of numerous *E. amylovora* isolates of various origin and to prove the homogenicity and heterogenicity of the investigated strains (Table 1).

All investigated strains caused hypersensitive reaction on tobacco (cv. White Burley), black night-shade and pelargonium leaves (Table 6).

Necrotic lesions followed by the occurrence of bacterial exudate were visible on artificially inoculated unripened pear fruits (William's), plum (*Stanley*), apple (*Gloster*), cherry (*Sue*). Different degree of the pathogenicity of the investigated strains was noticed on the artificially inoculated apricot fruits (Hungarian the best) (Table 7).

All investigated strains caused tissue necrosis of artificially inoculated shoots of apple, pear, quice and firethorn (Table 8).

The investigated strains manifested big similarity in the utilization of nitrogen compounds, carbohydrates, degradation of macromolecules (starch, gelatin, lecithin) and in other biochemical characteristics. The investigated isolates of *E. amylovora* utilized glucose, fructose, sucrose, galactose, ribose trehalose, sorbitol, mannitol, glycerol, citric, formic, acetic and cis-aconitic acid, while they didn't utilize raffinose, lactose, maltose melesitose, D(-) arabinose, erythritol and dulcitol (Table 13 and 14).

On the basis of the results obtained, it can be concluded that significant differences between the investigated strains regarding their bacteriological characteristics and pathogenicity were not observed, which confirmed previously noticed resemblance of *E. amylovora* isolates originating from pomaceous fevit trees and ornamental plants, hosts of this bacterium.

Key *words: Erwinia amylovora;* strains of various origin; bacteriological characteristics; pathogenic characteristics.

*(Received: August 7, 1998)*
*(Accepted: March 4, 1999)*

Plant Protection, Vol. 49(2), 224: 121–167, 1998, Belgrade

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*(Primljeno: 01.06.1998.)*
*(Prihvaćeno: 04.03.1999.)*

## BIOCHEMICAL AND PHYSIOLOGICAL CHARACTERISTICS OF THE BACTERIA "ERWINIA CAROTOVORA" GROUP OF DIFFERENT ORIGIN

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Summary

The bacteriological properties of 24 strains were examined (Table 1). It was proved that they belong to *Erwinia carotovora* ssp. *carotovora* (Jones) Bergey et al., *Erwinia carotovora* ssp. *atroseptica* (van Hall) Dye and *Erwinia chrysanthemi* Burkholder et al. bacteria (Table 1).

Unlike the shown information with morphological and cultural characteristics, the studied strains showed heterogeneous properties in the following biochemical and physiological tests: acid production from maltose and L-methyl glycoside, reducing substances from sucrose and erythromycin sensitivity (Table 2). It probably showed the existance of the new biovars or intermediate strains in *Erwinia carotovora* group.

The results prove the importance of studying of the bacteriological properties of these bacteria.

Key words: *Erwinia carotovora: E. c. ssp. carotovora; E. c. ssp. atroseptica; E. chrysanthemi;* biochemical and physiological properties.

*(Received: June 01, 1998)*
*(Accepted: March 04, 1999)*

Plant Protection, Vol. 49(2), 224: 169–180, 1998., Belgrade

# DEFORMATIONS OF BRANCHES AND PLUM TREE DECLINE AS A SPECIFIC REACTION TO PLUM POX (SHARKA) VIRUS

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**Summary**

Over a several-year-long period of investigations on the resistance of 25 plum cultivars and 40 hybrids to sharka virus, unusual symptoms, namely, swellings on the branches, bark splitting, cankers, dieback of both individual branches and the whole tree, were recorded on the artificially inoculated and infected trees. Studies were conducted in experimental plantings, upon which at least two trees were graft-inoculated with buds infected with M strain of sharka virus in the first year after planting. At least two trees of each cultivar were included as a control. The changes on infected tree were monitored over 16-year-long period.

Apart from the usual and well-known disease symptoms manifested on leaves and fruits of susceptible cultivars, characteristic changes such as swellings on the branches, bark splitting and canker were recorded in the following cultivars and hybrids: Cambridge Gage, Italian Prune, Kirke's Blue, Königsbacher, V/96, WJ-3, WJ-9, WJ-20, WJ-24, WJ-41 and WJ-44.

Dieback of inoculated and infected trees of cv. Prune Damson occurred concurrently with development of natural resistance in controlled trees of the same cultivar to infections through leaf aphids. The appearance of swellings, bark splitting and xylem necrosis, as well as, the appearance of natural resistance were explained by hypersensitive reactions of the mentioned cultivars. Nevertheless, hypersensitive reactions of the investigated cultivars in nocase case induced the resistance to graft-inoculation.

In the same trials, the similar changes were not recorded in formerly introduced and commercially grown plum cultivars in Yugoslavia.

*Key words:* sharka virus; branch deformation; tree decline

*(Received: May 28, 1998.)*
*(Accepted: March 4, 1998.)*

Plant Protection, Vol. 49(2), 224: 181–187, 1998, Belgrade