UDK 632.9

YU ISSN 0372-7866

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

ZAŠTITA BILJA
PLANT PROTECTION

VOL. 49(1), No 223, 1998.

Zaštita bilja vol. 49(1) Br. 223 (str. 1-96 Beograd, 1998.

CONTENTS

Reviews papers

Original scientific papers

NEW APPROACHES IN MAIZE BREEDING FOR RESISTANCE TO BIOAGENTS AND HERBICIDES

Dragica Ivanović[1] and M. Ivanović[2]

[1]Maize Research Institute, Zemun Polje, Belgrade - Zemun ;
[2]Faculty of Agriculture, Belgrade - Zemun

Summary

Maize breeding for resistance to bioagents and herbicides can be improved by the use of protoplast, cell and tissue culture and by recombinant DNA technologies. There are two procedures in tissue culture: 1- without selection pressure and 2- with selection pressure. The later encompasses plant transformation and regeneration *in vitro* in the presence of parasites, their toxic products or chemical components of herbicides. To develop a genetically transformed plant with an agriculturally useful trait two components have to be involved: a suitable transformation system of plant regeneration *in vitro* and an useful gene, i.e. target gene.

A target gene may be transferred to a plant in different ways. The tumor inducing (Ti) plasmids of *Agrobacterium tumefaciens* is often used as a vector of target gene. In addition, a target gene may also be introduced into plant cells by a bombardment of embriogenic calli or protoplasts using various DNA microprojectiles. This method resulted in transgenic, fertile maize plants with a *bar* and MDMV-CP gene. The *bar* gene, a and isolated from *Streptomyces hygroscopicus* and producing PAT protein (phosphinothricin acetyltransferase), has contributed to maize resistance to the herbicide glufosinat ammonium. The MDMV-CP gene of the sugarcane mosaic virus has contributed to maize resistance to both the maize dwarf mosaic virus (MDMV) and the maize chlorotic mottle virus (MCMV).

Tissue and cell culture techniques are considered very convenient for the identification of mutants tolerant to herbicides. A continuous exposure of cells to a low herbicide concentration has contributed to their gradual adaptation. To date transformed maize plants have been found to be resistant to the following herbicides: glufosinate-ammonium (Basta), glyphosate (Roundup), sulphonylurea and bialaphos. However, prior to the introduction of transgenic genotypes into commercial use it is necessary to test their efficiency under different agroecological conditions.

Transgenic maize plants with a Bt gene (from *Bacillus thuringiensis*) ensure resistance to European corn borer (*Ostrinia nubilalis* Hübner). The Bt gene, in transgenic maize plants, may be expressed in the plant as a whole or in certain parts of plants such as green tissue or pollen. Plant protection from European corn borer, achieved by the Bt gene, ranged from 50 to 99%.

The possibilities of new technologies are, however, limited when traits are regulated by a number of genes (polygenic traits). In such cases, greater success might be achieved using conventional plant breeding methods combined with molecular markers.

Transgenic resistance of maize to bioagents and some herbicides will most probably improve disease and weed control in the scope of integral maize protection management.

Key words: maize; resistance; tissue culture; genetic engineering; bioagents; herbicides.

(Received: March 9, 1998.
(Acepted: 3.12.1998.)

Plant Protection, Vol. 49(1),223: 5 - 27,1998, Belgrade

PATHOGENIC CHARACTERISTICS OF THE BACTERIA *"ERWINIA CAROTOVORA"* GROUP OF DIFFERENT ORIGIN

Olivera Jovanović
Faculty of Agriculture, Beograd-Zemun

Summary

The pathogenic properties of 24 *Erwinia carotovora* soft rot strains originating from potato *(Erwinia carotovora ssp.atroseptica* (van Hall) Dye, potato, cabbage, pepper, eggplant, sansevieria, difenbahia, aloe and sunflower *(Erwinia carotovora* ssp. *carotovora* (Jones) Bergey et al.) and maize *(Erwinia chrysanthemi* Burkholder et al.) were examined (Table 1).

The check, of the pathogenicity was done by inoculation of 23 hosts at four different temperatures (18, 24, 28° and 32°C), using four different concentrations of bacterial suspension (10^6, 10^7, 10^8 and 10^9 cfu/ml).

The optimal temperature for the intensive pathogenicity with the strains of *E. c. ssp.atroseptica* originated from potato was 24°C. High pathogenicity of *E. c. ssp.carotovora* strains was obtained at 32°C for plants, vegetable slices and cauliflower's blossom as well as at 24°C for the parts of the leaves, unripe vegetable fruits and onion bulbs. The optimal temperature for the pathogenicity of *E. chrysanthemi* strains was 28°C for the leaves parts and 32°C for all other inoculated hosts (Table 1-7 and Graph. 1-9).

The most intensive pathogenicity was obtained using bacterial suspension of 10^9 cfu/ml concentration, accenting that concentrations of 10^8 and 10^7 cfu/ml were sufficient in virulent strains (Table 1-7 and Graph. 1-9).

Key words: Erwinia carotovora; E.c.ssp.carotovora; E.c.ssp.atroseptica; E.chrysanthemi; pathogenic characteristics; concentration of bacterial suspension; temperatures.

(Received: Juny 1,. 1998.)
(Acepted: 3.12.1998.)

PATHOGENICITY CHECK OF SOME FUNGAL SPECIES, THE BLACKBERRY PATHOGENS USING APPLE FRUITS

M. Veselić[1] and M. Arsenijević[2,3]

[1] Center for Agriculture, Šabac; Faculty of Agriculture, Novi Sad; [3] Institute for Plant Protection and Environment, Belgrade, Topčider

Summary

Many fungal species attack blackberry canes in Yugoslavia causing their necrosis and dieback. For pathogenicity check of the strains isolated apple fruits have been used. Artificial inoculation was carried out transmitting the colony fragments into the wounded sites previously prepared.

Inoculated apple fruits were kept for 48 hours in moist chamber and afterward in laboratory condition. The results were taken 3, 6, and 18 days after inoculation (Table 1).

It was showen that apple fruits may successfully be used as a test of the pathogenicity for fungal isolates originating from blackberry plants but not for all species (Table 1).

Key words: blackberry, fungal isolates; apple fruits; artificial inoculation; pathogenicity test; *Gnomonia rostellata*; *Phomopsis* sp.; *Seimatosporium lichenicola*; *Septocyta ruborum*.

(Received: October 26, 1998.)
(Accepted:3.12.1998.)

Plant Protection, Vol. 49(1), N^{O} 223: 71–76, 1998, Belgrade

PERIOD AND INTENSITY OF *CHEILOSIA CORYDON* (HARRIS) (*DIPTERA: SYRPHIDAE*) OVIPOSITION ON RUDERAL PLANTS OF CARDUUS ACANTHOIDES L. AND *CARDUUS NUTANS L. (ASTERACEAE)*

B. Manojlović, A. Zabel[1], and M. Kostić[2]

Institute for Plant Protection and Environment, Belgrade
Institute for Medicinal Plant Research "Dr. Josif Pančić", Belgrade

Summary

In this paper the ovipositional period and the intesity of the egg laying of *Cheilosia corydon* (Harris) (*Diptera: Syrphidae*), and the actractiveness of the ruderal plants *Carduus acanthoides* L. and *Carduus nutans* L., (*Asteraceae*) for the oviposition of this useful insect were researched.

The ovipositional period of *C. corydon* under the climatic conditions of continental part of Serbia lasts from the third decade of March, during Aprile, till the early May. The ovipositional period of *C. corydon* on the plants of *Corduus acanthoides* L. and *Carduus nutans* L. in the region under study in 1990 lasted 38 days (from 28 March to 5 May). The biggest numbers of eggs were deposited in the period from 8 to 27 Aprile.

On *C. acanthoides* plants the largest numbers of eggs were deposited on 14 Aprile, when 27 new eggs were registered on 7 plants (28%), which makes 7,16% in relation to the total number of deposited eggs during the whole ovipositional period. The oviposition of *C. corydon* on *C. nutans* was very intensive in the period from 12 to 24 Aprile, especially on 18 Aprile, when on 9 plants (36%) there were 47 newly deposited eggs, or 7,77% in relation to the total number of deposited eggs.

In 1991, embrional period of *C. corydon* lasted the same as the previous year, but it started something earlier, i. e. in the beginning of the third decade of March and it lasted till the third decade of April. *C. corydon* deposited the largest numbers of eggs on *C. acanthoides* plants in the period from 5 to 10 Aprile, with the maximum on 7 April when on 5 plants (20%) the total of 23 eggs were registered or 7,23% in relation to the total number of deposited eggs. The same year, intensive oviposition on *C. nutans* plants was from 7 to 10 Aprile. The oviposition was especially pronounced on 9 Aprile, when 37 new eggs were found on 9 plants, which makes 8,81% of the total number of deposited eggs on this weed.

C. corydon deposited considerably higher number on both plant species in 1990 (982) then in 1991 (738).

C. nutans is more attractive host plant for C. corydon oviposition in relation to *C. acanthoides*. On 25 plants of *C. acanthoides* 377 eggs (38,39%) were deposited during the whole ovipositional period in 1990 (18,08 eggs on the average per plant), and on *C. nutans* 605 eggs (61,61%) or 24,20 eggs on the average per plant. In 1991 on the same numbers of *C. acanthoides* plants there were the total of 318 eggs (43,10%) which makes 12,72 eggs per plant on the average, and on *C. nutans* 420 eggs (16,80 per plant) or 56,90% in relation to the total number of eggs (738) deposited on both weed species.

The eggs are elongated, of the average lenght of 1,3±0,05 mm, and width 0,49±0,03 mm.

Key words: Cheilosia corydon, - Corduus acauthoides, - Corduus nutaus, - Eggs, - Ovipostion, Ruderal plants, Population, Shoot, Leaf.

(Received: 13.03. 1998.)
(Accepted: 3.12.1998.)

Plant Protection, Vol. 49(1), Wo 223:85–91, 1998, Belgrade