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Original scientific papers

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Original scientific paper

FIRE BLIGHT OF POMACEOUS FRUIT TREES IN YUGOSLAVIA

A large number of the bacterial isolates having white colonies was isolated from numerous samples of infected pear and quince trees originating from Macedonia, Bosnia and Serbia. On the basis of the morphological, cultural, biochemical and physiological tests as well as on the it was proved that the investigated strains belonged to the quarantine bacterium *Erwinia amylovora* (Burrill) Winslow et al., experimentally proved for the first time in Yugoslavia.

Key Words: Fireblight; Pomaceous Trees; Quararitine Bacterium; Quince Trees; Pear Trees; *Erwinia amylovora*.

Introduction

Due to the expansive distribution and severe destructive effect expressed on the pomaceous fruit trees (primarely on pear and apple trees) fire–blight has become a leading problem of enormous economic importance in the fruit growing regions of many European countries. In recent few years (except in Great Britain, Poland, Netherlands, Denmark, Germany, France and Belgium, where it was recorded in the period from 1957 to 1927) the disease was also found in Luxembourg, Cyprus, Turkey, Sweden, Norway, Ireland, Greece, Czechoslovakia and Switzerland (Arsenijević, 1989; Arsenijević and Panić, 1990a). In Yugoslavia, the disease has been proved officially for the first time in 1990 (Arsenijević and Panić, 1990b; Panić and Arsenijević, 1991a, 1991b; EPPO Reporting Service, 1991; Pejčinovski, 1990).

On the basis of the infected samples avaliable for the laboratory analysis, bacterial tests and the tests of the pathogenicity carried out at the Faculties of Agriculture in Zemun and Novi Sad, the causal agent of this disease, *Erwinia amylovora*, was found in 11 municipalities of Macedonia, in 2 localiteis of Bosnia and in 4 municipalities of Serbia (Arsenijević and Panić, 1990b; Panić and Arsenijević, 1991a, 1991b).

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Original scientific paper

THE REACTION OF SPRING WHEAT GENOTYPES AND Yr. LINES TO PUCCINIA STRIIFORMIS IN HILLY–MOUNTAIN REGIONS OF BOSNIA AND HERZEGOVINA

The resistance of spring wheat genotypes along 16 Yr. lines to *Puccinia striiformis* was examined at the localities of Nevesinje, Gacko, Duvno and Kupres in 1979, 1980 and 1981. All of the Yugoslav varieties and lines revealed susceptible reactions, except the ZA–60 which showed resistance. The NS–51–26, Romanija, Era and Tobari 66 expressed less susceptibility. The lines Yr.2, Yr.3b+5b, Yr.5, Yr.9, Yr.10, (Mo), Yr.10 (Cl), Hyb. de Ber., S–112 and Tr. dic. G. 25 were resistant,a nd Yr.1, Yr.3a+4a, Yr.6, Yr.7, Yr.8 and Maris Huntsman were susceptible. The above mentioned suggests that only the resistant line ZA–60 contains one or more efficient Yr. genes.

Key words: wheat, yellow rust, disease resistance

Introduction

In the growing of the spring wheat varieties in the hilly mountain regions of Bosnia and Herzegovina, a great importance of the yellow rust *(Fuccinia striiformis)* was noticed.

As for the other rust species, also for the *Puccinia striiformis* the sources of monogenic and oligogenic resistance were established by selection. Macer (1972) described the major genes marked as Yr.1 to Yr.7.

From the wild species *Aegilops comosa,* a dominant gene was taken and marked as Yr.8 (Riley *et al.,* 1968). Several resistant varieties with one of the mentioned Yr. genes had to be excluded from the production due to the occurrence of new physiological races (Howard *et al.,* 1970). The same authors report that some other resistant varieties, such as Yeoman, Browick, Cappelle–Deprez have retained their resistance for a long time, and the variety Little Joss since 1900.

Lupton and Johnson (1970) first explained that the resistance of the variety Little Joss was conditioned by polygenes, and later by a smaller of genes (Luton *et al.,* 1973). It shows that the resistance depends of one or more genes of wider efficiency, as well as of several minor genes.

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Original scientific paper

VERIFICATION OF THE DEVELOPMENT OF THE DIAPORTHE HELIANTHI TELEOMORPH DURING THE WINTER 1989–1990

The results obtained in this study confirm that in *D. helianthi* the time when ascogonia begin to be formed and the subsequent development of the perithecia are affected by climatic conditions. The development of the protoperithecia that were observed in December 1989 was detained in January and February 1990 due to the lack of favorable moisture and temperature. The protoperithecia continued to develop in March after a short rain spell. The full maturation of perithecia in May was preceded by anotehr rain spell in April.

Key words: Diporthe helionthi, sunflower, development, perithecia

Introduction

Since the first outbreak of the sunflower disease caused by the fungus *Diaporthe helianthi* Muntañola–Cvetković et al. (anamorph: *Phomopsis helianthi* Muntañola–Cvetković et al.) in Vojvodina, in 1980, until today, we have published several papers on the morphological, physiological and phytopathological characteristics of the pathogen and its life–cycle (Muntañola–Cvetković et al., 1981; 1985a; 1985b; 1988). These investigations showed that the development–cycle of the *D. helianthi* holomorph has two phases: the anamorphic phase, which takes place in summer into the vegetative parts of sunflower plants; and the teleomorphic phase, which evolves during the winter into sunflower harvest residues. It was also found that the time when the ascogonia began to be formed and the development of the ascomata differed from year to year depending on the weather conditions.

The aim of this paper was to check the validity of our earlier statements concerning the occurrence of the teleomorphic stage of *D. helianthi*, through a

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Original Scientific paper

ERYSIPHE MAYORII BLUMER, A NEW PARASITE ON CIRSIUM ARVENSE (L.) SCOP. IN YUGOSLAVIA

Erysiphe mayorii is described for the first time as causer of powdery mildew on the *Cirşium arvense* in Yugoslavia.

Key words: powdery mildew, *Erysiphe mayorii*, *Cirsium arvense*

Introduction

Fungi of the *Erysiphe* (DC.) FR. genus are known as the causers of a powdery mildew on different plant species. *Erysiphe cichoracearum* (DC.) Merat (Škorić, 1926) develops on *Cirsium arvense* in Repablic of Croatia, Yugoslavia. However, according to the literature data, the above mentioned disease can be caused by the other species of this family. Besides *Erysiphe cichoracearum*, Junell (1967) in Sweden, Sandu – Ville (1967) in Rumania, Salata (1985) in Poland, a number of other researchers reported the presence of *Erysiphe mayorii*.

The goal of this study is to prove possible presence of these, as well as other species, and related role they play as the powdery mildew causers on the mentioned host in Yugoslavia.

Material and Methods

Sampels of infected *Cirsium arvense* were collected in the localities of Serbia during the period 1987–1990. The conidial state of pathogenes was studied on fresh, and ascus state on herbal material. The following taxonomic characteristics of the species are investigated: the appearance and size of the entwined mycelia coating with conidiophores and conidia, cleistothecia; the appearance, size and distribution of conidia; the shape and type of conidiophore, also the mode and speed of germination of conidia; the distribution, and size of cleistothecia, the shape and size of their wall cells; distribution, number shape and length of the appendages on cleistothecia; the number of asci in them and their appearance and dimensions; the number of ascospores in the ascus, their shape and size.

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Original scientific paper

PHYTOPHAGOUS INSECT SPECIES OF THE FAMILY TEPHRITIDAE (DIPTERA) REGISTERED IN THE CENTAUREA SOLSTITIALIS L. (ASTERACEAE) FLOWER HEADS

This paper deals with the impact and distribution of phytophagous insects of the family *Tephritidae (Diptera)* in the flower heads of *C. solstitialis* registered on the sandy sites in the vicinity of Belgrade.

The *C. solstitialis* flower heads were attacked by the 4 insect species of the family *Tephritidae*, as follows: *Urophora sirunaseva* Hg., *U. quadrifasciata* Mg., *Chaetorellia hexachaeta* Hering and *Achantiophilus helianthi* Rossi. Intensity of the attack and number of all the insect specels registered in the *C. solstitialis* flower heads during the summer period ranged from 14% (average: 0.34 insects per flower head in 1989) to 39% (0.73 insect per flower head in 1987). Of all the insect species registered in the *C. solstitialis* flower heads *U. sirunaseva* was a predominant species. *C. sirunaseva* appears to be the predominant in the overwintered ones.

Key words: Tephritidae, insects, *Centaurea*, weed

Introduction

Centaurea solstitialis L. is a submediterranean plant native to south and southwest Europe, some regions of west Asia and North Africa (M a d d o x, 1981). The species has been spread in Europe over 3 regions: the Atlantic–Mediterranean (South France, Spain); the Adriatic–Mediterranean (Italy, Sicily) and the Mediterranean (the Adriatic coast, Yugoslavia, Greece, Bulgaria, west Turkey).

Centaurea solstitialis is an annual plant. It grows mainly on dry, uncultivated sites. The species form a dense cover and has allelopatic effects on the other vegetation. It reduces radically the feeding value of pastures due to containing toxins, and can cause syndrome known as *„chewing disease"* and lead to animal death (M a d d o x, 1986).

However, different than in North America where the species after the introduction spread and covered in high density large areas, in our country the related density of this weedy plant did not overcome a tolerable level for a long time.

A number of important biotic and abiotic factors regulate the population density of the species in Yugoslavia. Of special importance are the insects as the most numerous class of animals the majority of which are herbivorae consuming average 15% of a total

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Original scientific paper

THE CHARACTERISTICS OF BACULOVIRUSES (NPV) OF CABBAGE MOTH (MAMESTRA BRASSICAE L.)

Under the laboratory and field conditions it has been found that the resistance of cabbage moth *(M. brassicae)* to Baculovirus of the nuclear polyhedrosis increases following the larvalage. The Baculovirus developes faster at higher temperatures. Diseased larvae produce a great number of polyhedrons. LI_{50} (inactivation) of NPV in the field was 3.7 days. The population density of *M. brassicae* did not play significant role for horizontal spread of the nuclear polyhedrosis disease. The Baculovirus developed in the cabbage field on the larvae of the following Noctuidae species: *M. brassicae, M. oleracea* and *A. gammae.*

Key words: Cabbage moth, *Mamestra brassicae,* baculoviruses

Introduction

Cabbage moth *(Mamestra brassicae* L.) is the most important pest in ephemeral habitat considered as r—selected pest. It has a great reproduction potential (a female lays up to 2725 eggs, Nikolova, 1946); two generations per a year; lives hidden in a cabbage head and pupates in soil. Such life cycle enables cabbage moth to exceed the damage threshold of 2% plants under the conditions of monoculture (Injac, Krnjajić, 1989).

The cabbage moth diseases occure rarely; on the studied comercial cabbage fields, diseased larvae were not registered. But in some relatively stable habitats such as sugar beet, where cabbage moth can develop two generations per a year, the nuclear polyhedrosis diseased larvae were found (Sidor, 1982, personal communication). Occasional occurence of the nuclear polyhedrosis disease with a low prevalence has been registered in some other countires, such as Czechoslovakia (Jasić, Veber, 1962). Japan (Aruga, and all. 1962) and Ukraine (Sikoura, 1975).

One of natural enemies used in the biological control is *T. evanescens,* the egg parasitoid, in addition to the other biocontrol methods. The other possibility is Baculovirus from the subgroup of Nuclear Polyhedrosis Virus (NPV) due to narrow

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Original scientific paper

EVALUATION OF EMISSION OF SO_2 AND OCCURRENCE OF PATHOGENIC FUNGY OF FOREST TREE SPECIES

There are some information of the response of the pathogenic fungi in forests to SO_2 emission. The aim of this paper was to correlate the different reactions of spruce, Austrian pine, Scots pine, European larch, sessile oak, beech, walnut lime tree and buckey (horse chestnut) to SO_2 emission; the distance of the source of the emission; the foliage concentration of sulfate and the occurence and distributions of the fungal pathogens.

Key words: SO_2 emission, influence, fungi, forest tree

Introduction

Sulphur is an important nutirtional element needed by plants; however, imbalances can cause deleterious methabolic and visible effects. Normally, sulphur is taken up by plants from soil in the sulphate forms and assimilated into various compounds, usually after being chemically reduced. SO_2, absorbed from air, can also supply sulphur for plant nutrition, and the assimilation pattern into the plant components is the same, whether the element is supplied to the root as sulphate or absorbed through the stomatas as SO_2. It is estimated that SO_2, absorbed by leaves, oxidized very fast to the sulphate form and in the sublethal concentratioons, up to 40% of total needed sulphur, could originate from atmospheric SO_2 (Scharer, M., Brunold, K. C., Frisman, H., 1976). Concentrations of sulphur, especially sulphate form, in plant foliage can provide useful diagnostic data for determining the excesses SO_2 concentrations in the atmosphere of plant.

Pathogenic fungi could react to excess the content of atmospheric SO_2 in two ways. Their occurence and distribution could be result of the direct effects of SO_2 to the fungi cells, but it could also be the result of the methabolic disturbances in teh cells of the plant host. It is well known that the factors of the methabolic stress of host plants could induce or inhibit the colonization of pathogenic fungi.