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SO FAR INVESTIGATIONS ON EUROPEAN CORN BORER
ENTOMOPHAGOUS (OSTRINIA NUBILALIS HBN.,
LEPIDOPTERA: PYRALIDAE) IN YUGOSLAVIA

by

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Summary

The first investigations of the entomophagous of European Corn Borer in Yugoslavia date from the beginning of the 1920's of this century, when the International laboratory for this pest investigations was formed in Zagreb. With more or less details, the following entomophagous organisms of European Corn Borer were investigated in Yugoslavia:

Lydella thompsoni Hrt., *Pseudoperichaeta nigrolineata* Walker (= *Zenillia roseanae* Brauer & Berg.), *Eumea mitis* Meigen, *Clemelis pullata* Meigen (Dip. : Tachinidae), *Sinophorus alkae* Ell. & Sact. (= *Campoplex alkae* Ell. & Sact.), *Eriborus terebrans* Graves (= *Diadegma terebrans* Graves, *Horogenes punctorius* Roman), *Exerister roborator* Fab., *Exetastes illusor* Fab., *Pimpla instigator* F. (Hym. : Ichneumonidae), *Simpiesis viridula* (Thomson) (= *Eulophus viridulus* Thomson) (Hym. : Eulophidae), *Bracon hebetor* Say (= *Microbracon brevicornis* Wesm.), *Macrocentrus linearis* Wesm. (Hym. : Braconidae), *Richogramma evanescens* Westw. (Hym. : Trichogrammatidae), *Myrmica laevinodis* Nyl. i *Lasius emarginatus* Oliv. (Hym. : Formicidae), *Coccinella septempunctata* (L.) (Col. : Coccinellidae), *Chrysopa vulgaris* Sch. (Neuroptera : Chrysopidae), *Trombidium (Alothrombium) fuliginosum* Herm. (Acarinae : Trombididae), *Hirunda rustica* and *Careus frugilegus* (Aves).

The special attention was paid to the following caterpillar parasites by our investigators: *L. thompsoni*, *S. alkae*, *E. terebrans*, *S. viridula*, *B. hebetor* and *M. linearis* and to the egg parasite *T. evanescens*.

For the tahine *L. thompsoni* and the wasps *S. alkae* and *S. viridula*, the unsynchronism in the growth with their host range was proved, in contrast to *E. terebrans*, which completely coincides at the growth with the European Corn Borer caterpillars.

The plants of maize, broomcorn, pepper, pigweed, thorn apple, burdock and wormwood were the most attractive for *L. thompsoni*. This species is especially numerous in maize hybrids of full vegetation (FAO 600 and FAO 700). *S. alkae* parasited most frequently the European Corn Borer caterpillars, which fed and grew in the plants of hemp, eggplant, hops, thorn apple, burdock and wormwood. On the maize plants it is more numerous at the hybrids of the full vegetation period.

S. viridula is dominant parasite of European Corn Borer caterpillars, which fed and grew in the plants of hemp, millet and foxtail millet, and it is also frequent at the plants of eggplant, hops, thorn apple, burdock and wormwood. Maize as European Corn Borer host plant, also manifested low attractiveness for this useful insect.

In the natural conditions, the whole *B. hebetor* growth is completed in 2 weeks. In these conditions, the imago of the wasp lives around 10 days.

The larvae of *M. linearis* grow in group in caterpillar skin, where they fed as ectoparasites. The pupal stage lasts 15 - 19 days. The imago flies out at the end of June and at the beginning of July at the time of the flight of European Corn Borer. All parasite individuals grown in the host individual are of the same sex, which points to poliemia.

T. evanescens is endofagous parasite with very expressed polyphagousity. In the region of Bačka Palanka, the total course of 1975-77 was 4,95%, 6,00% and 3,99%. Slightly lower parasitism was proved on hemp (3,20%, 7,44%, 4,96%) and on hops (2,97%, 0,97%, 2,81%).

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INTERNATIONAL TESTING OF GENETICALLY DIFFERENT SOURCES OF RESISTANCE TO PUCCINIA RECONDITA TRITICI AND OTHER WHEAT PATHOGENS

European Leaf Rust of Wheat Nurseries (ELRWN 1989/90.) have been composed of 20 genetically different resistant spring wheat lines and five isogenic Lr lines. This cooperative investigations are refer to interactions between genetically different sources of resistance of wheat to the wide spectrum of virulence of *Puccinia recondita tritici*. ELRWN have been tested in the seedling stage to different international pathogen cultures and in the adult stage on the large European-Med. epidemiological territory. Cooperative seedling testings of this nursery have been realized in eight countries. The field reactions of ELRWN 1989/90. to pathogens of leaf rust, stem rust, yellow rust, powdery mildew and *Septoria* sp. have been evaluated in thirteen countries. The best evaluated lines for leaf rust in the seedling and adult stage, were, winter wheat lines: NS-66-9/2, NS-9419/2, NS-94-24/1, NS-77-19/4, NS-32-9/4, NS-32-2473 and NS-146-19/5 and spring wheat lines: 647-CMA-14793, 11-TH-ESWYT-25, 26-TH-ESWYT-3, 26-TH-ESWYT-10 and 26-TH-ESWYT-49.

Key words: disease resistance, wheat, leaf rust, sources of resistance.

Introduction

For many years now leaf rust of wheat caused by *Puccinia recondita* Rob. ex Desm. f. sp. *tritici* Eriks. and Henn. has posed a great problem in normal wheat production, as the most widespread wheat disease in the world. It is well know, that the best method of rust pathogens control rust pathogens are international cooperative studies which would cover large epidemiological areas (Bošković, 1976; Bošković and Bošković 1988; Stubbs, 1972; Stubbs et al., 1974). Our new objective in international pathogenicity survey of *P. recondita tritici* is to provide genetically diverse sources of resistance to leaf rust for the use in European-Mediterranean regions, and to search for and document pathogenicity of *P. recondita tritici* cultures useful in differentiating sources of resistance. Emphasis is placed on sources of resistance and their usefulness rather than on discription of the fungus populations (Bošković and Bošković, 1992; 1993).

EFFICIENCY OF FUNGICIDES IN *PYRENOPHORA* *GRAMINEA* CONTROL AND EFFECT ON BARLEY YIELD

by

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Summary

One of the most important pathogens, which can endanger normal barley growth is *Pyrenophora graminea* Ito and Kuriba. Among the most efficient precautions for the parasite control is the use of fungicides for seed treatment.

In connection with this, in our paper the efficiency of 21 fungicides with one up to three active substances, which belong to the following chemical groups: carbamates-benzimidazoles (carbendazim, tiabendazol and fuberidasol), ditiocarbamates - EBDC (mancozeb and maneb), ditiocarbamates-tiurames (TMTD), ftalamides (captan), dicarboximides (iprodion), analides (Carboxin), primidines (etirimol, nuarimol), guanidines (guazatinacetate and guazatinricetate), hinoleines (Cu-8-hydroxihynolin), imidasoles (imazalil), triasoles (triadimenol hydroxihynolin), imidasoles (imazalil), triasoles (triadimenol and flutriafol), derivateve of benasen (bezotiazoles - TCMTB) and organomercury compounds (metoxietilmercuryacetate, phenilmercuryacetate, phenilmercurychloride).

The investigations were carried out in two localities (Pančevo and Obrenovac) and two types of soil (dark fertile soil and aluvium), and they lasted for four years, and besides the efficiency, the effect on yield was investigated.

The sowing of treated seed was carried out on time (the end of October and the beginning of November), which has favorable effect on disease occurrence. In the locality of Obrenovac, it was obtained the average disease rate of 23,5%, and in the locality of Pančevo 29,0%.

The manifested efficiency was in correlation with the toxicity to mycelium in laboratory conditions, besides at fungicides on the basis of carboxin + Cu-9-hydroxihynolate and TCMTB.

The highest efficiency, over 80%, had fungicides on the basis of TMTD-a + carboxin, maneb, guazainriacetate and Cu-8-hydroxihynolate, and insufficient, under 60%, all other fungicides.

The highest increase, of 36,6%, was at fungicides on the basis of iprodion + carbendazim, and high efficiency of fungicides on the basis of mercury was not followed by the adequate increase of yield.

The lowest yield was achieved at fungicides on the basis of triadimenol, which is the result of higher percentage of disease by the fungus *P. graminea* than on the non-treated variant.

NEW MEMBER OF THE HARMFUL ENTOMOFAUNA OF YUGOSLAVIA
DIABROTICA VIRGIFERA VIRGIFERA LECONTE
(COLEOPTERA, CHRISOMELIDAE)

by

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S u m m a r y

In mid July 1992 a severe attack of *Diabrotica virgifera virgifera* LeConte, a new maize pest, was observed, known in literature as western corn rootworm. (WCR) The occurrence of imagoes was observed on a 0.5 ha small-farmer plot in the vicinity of the Belgrade Airport. This led to the assumption that the pest was most probably introduced into this country right there. A more detailed study of the distribution of *Diabrotica* conducted in July and August of 1993 in the broader area of Srem, Banat, Bačka, Stig, along the right bank of the Sava River and in the Kosovo and Metohia Region, confirmed this assumption. On the basis of these findings, it was established that the pest spread from the Surcin Plateau to the northwest into Lower Srem crossing both the Sava and Danube rivers.

The symptoms of larvae attack are manifested in plant lodging and leaf chlorosis which is characteristic of nutritive matter deficiency. On surveying plants, a greater number of imagoes, yellowish in colour with three black strips along the wing covers was found. The imago is about 6-7 mm in size. It feeds on leaves, pollen, and later, on silks and ear tip. The imago is less damaging than the larvae.

This species has only one generation per year. It deposits eggs in the soil from mid-summer until autumn and overwinters in diapausing egg stadium. Larvae are slender and white in colour. Pupating takes place in small chambers in the soil. Imagoes begin to emerge from end of June to mid August. The males emerge first and the females follow about five to ten days later. Mating takes place soon after emergence, while supplemental feeding lasts until mid September.

Larvae live in the soil. They resemble white worms and therefore, species of the genus *Diabrotica* found in maize, were named "corn rootworm". Larvae feed on the root system chewing into it and tunnel the underground basal part of the maize stalk. Due to the reduction of the root system and July rains accompanied regularly by wind, plants tend to lodge. Such plants develop brace roots and gradually straighten out. These plants grow in a "gooseneck" shape and reveal pest attack before the actual occurrence of imagoes.

The identification of the species was performed by Dr. J. Krysan, National Programme Manager of the Laboratory for Insect Systematics in Beltsville, Maryland, USA.

Of the three species of the genus *Diabrotica* attacking maize, *Diabrotica virgifera virgifera* is the most widely distributed and most harmful in the US Corn Belt. So far, it was only found in North America. This is the first case reporting its presence in Europe.

On the basis of two-year observations, it was found that larvae are severely damaging to maize and that imagoes cover huge distances quickly. This indicates that it is an exceptionally important species.

EFFECT OF NUTRITION ON INCIDENCE OF SUGAR BEET MOSAIC VIRUS ON SUGAR BEET

by

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Summary

The investigation were conducted during five years. According to the obtained results it could be concluded:

- nitrogen dosages applied in soil increased intensity of sugar beet mosaic virus infection on sugar beet. Statistically very significant increase of infection was observed between plants grown on unfertilized control plots and plots with 180 kg/ha of nitrogen added and also between plots with 90 kg/ha and 180 kg/ha of nitrogen added;

- different dosages and combinations of mineral fertilizers and manure increased incidence of sugar beet mosaic virus, compared to unfertilized control. In comparisson to unfertilized plots statistically very significant increase in percent of diseased sugar beet plants were registered on plots where different combinations and dosages of fertilizers were applied. There were no significant differences between fertilized variants.

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NATURAL ENEMIES ON COCCUS PSEUDOMAGNOLIARUM KUWANA IN COSTAL PART OF MONTENEGRO

In the region of Montenegrin Coast the citrus trees are attacked by a number of scales' species. The species *Coccus pseudomagnoliarum* Kuwana is most spread one, and it occurs at some places in great number causing serious harms on the agrumes. *C. pseudomagnoliarum* is attacked by its natural enemies - parasites and predators. Parasites, which decrease the scale population by 80% are more significant. Especially important are the parasites *Coccophagus lycimnia* Walker and *Metaphycus flavus* Howard; the other species, however, are less significant.

More important predator species are *Chylocorus bipusnulanus* and *Exochomus quadripusnulanus* (Coccinellidae) as well as a bug species *Campiloneura virgula* M.S. (Homoptera).

Key words: natural enemies, *Coccus pseudomagnoliarum*, scale, parasites, predators, Montenegro.

Introduction

In the region of Montenegrin coast the agrumes are attacked by a number of scales species, some of which occur in numerous populations, making at places great harms to these cultures. Presently the most spread and for the agrumes the most harmful is the species *Coccus pseudomagnoliarum* Kuwana. In some agrume groves it occurs in association with other species of scales, and most frequently with similar species *Coccus hesperidum*. Due to this, there is a frequent confusion about the species that appears. However, clear morphological differences in all their developmental stages coupled with difference in the biological development of the two species are obvious.

C. pseudomagnoliarum is widespread on the agrumes in the area of Montenegrin seacoast, and I have also recorded its presence in Dalmatia, on Pelješac, as well as in Istria and on the Brioni islands.

According to the literature data *C. pseudomagnoliarum* is distributed on agrumes in California, Florida and Texas, Ebeling (1959), and as he further quotes it is observed also in Mexico, Russia, Japan, Iran and Australia. According to Borskenius (1957) it is recorded in the USSR in Krasnodar's area, Azerbeyjan, and that it is also spread in Iran and Turkey. As for the Mediterranean, until now, it has been recorded also in Italy on Sicily and Calabria, Barbagallo (1974), and Öncüer and Tunçyrek (1975) recorded it in Turkey in the area between Ismir and Anadolı.

Na osnovu indeksa oboljenja može se zaključiti da pojedine novoselekcionisane linije poseduju niži stepen osetljivosti od nekih široko rasprostranjenih sorata, kao što je ovde ispitivana sorta Mali provansalac, čime se otvara mogućnost njihovog širenja u proizvodnoj praksi i rešenja problema pojave bolesti "antraknoze" graška.

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RESISTANCE OF PEA GENOTYPES TO *ASCOCHYTA PISI*

by

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Summary

In the course of the research we isolated a pathogenic fungus from some diseased pea seed. According to some investigated characteristics of the fungus we concluded that it belonged to *Ascochyta pisi* Lib. species. Using the method of artificial inoculation, we tested the resistance level of some pea genotypes to the fungus.

According to the reaction of the inoculated genotypes we divided them into three groups:

Tolerant: varieties Oscar, Pony express and line R4/53

Semi susceptible: variety Carina and lines ABMP-1, 19/17-2

Susceptible: variety Mali provansalac and lines NK8/2, 6/6S.

The selection of tolerant pea genotypes can be a solution for decreasing the losses caused by ascochyta blight.