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Original scientific papers

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THE PEST SPECIES OF CECIDOMYIDAE REGISTERED ON WHEAT IN SERBIA

by

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Summary

In the period 1948—1988 the presence and density of Cecidomyidae on wheat in Serbia were observed. The following species were reported: *Contarinia tritici* (Kurby), *Sitodiplosis mosellana* (Gehin) and *Haplodiplosis marginata* (von Roser). *S. mosellana* was registered in all the investigated localities, while *H. marginata* was reported for one locality, only. The number of *S. mosellana* larvae per 100 wheat seed ranged from 68 to 191; *C. tritici* from 430 to 1276, respectively (Tab. 2). The greatest number of the *H. marginata* larvae per a plant was 15. The impact of *H. marginata* was sever but limited. *Mayetiola destructor* (Say) was not found in Serbia during the above mentioned period.

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(Primljeno 25. XII 1990)

A CONTRIBUTION TO THE STUDIES ON *ASPHONDYLIA ROSMARINI* (KIEFFER) *(DIPTERA, CECIDOMYIDAE)*

by

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Summary

The galls of *Asphondylia rosmarini* (Kieff) were found in the following localities of the Adriatic coast: Budva, Dubrovnik, Tivat and Pula. The mass presence of the galls was registered on rosemary plants in the locality of Tivat. In the investigation period 1988—1990 two generations per year were reported. A young larva overwinters in cylindric setous galls placed on the lower side of a leaf. The flight of imagoes of the overwintered generation begins in the middle of March and finished at the beginning of September when the imagoes of the following generation have been found. The flight of imagoes is very prolonged, the generations are not clearly distinguished. Therefore, during a whole year on rosemary plants the galls of different age could be found. Completely formed gall is cup shaped with long petal. Broaden part bears solitaireous larva in a small chamber where a pupa is formed, too. The ambrosis of fungi were not found. The flight of imagoes could be followed on the basis of egzuviums which stick out from galls after the eclosion. The feeding plant of *A. rosmarini* is R.o.L. on which the species was determined in Yugoslavia. Although significant population density was registered in the locality of Tivat, serious damage was not made.

A CONTRIBUTION TO THE KNOWLEDGE ON *CHEILOSIA CORYDON (HARRIS) (DIPTERA: SYRPHIDAE)* ON WEEDY PLANT *CARDUUS ACHANTOIDES* L. *(ASTERACEA* DUM.)

by

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Summary

The objectives of this paper are the development. attack and density of the *C. corydon* (Harris) (=*grossa*) (Fallen) population registered on the weedy plant *C. achantoides* L. in the continental part of Yugoslavia.

Besides *C. achantoides*, *C. corydon* also attacks *C. nutans* L. Morphological differences have not been registered among the population on the above mentioned weeds.

C. corydon has one generation per year in continental part of Yugoslavia. It overwinters in the pupa stage. The imagoes fly during the second part of March and April. The females lay individual egs, although 3—4 eggs in cluster have been often found on young leaves and shoots in the central part of a plant. The eggs are hatched intensively in the first decade of April. The greatest nubmer of hatched eggs (average 3,1; maximum 34 on 68% of the palnts) was registered on the 4th April, while in the following year it was the 10th April (on 82% of the plants the average percentage of hatched eggs was 6,4 and maximum 67 eggs per plant). It appears that the period of eggs hatching is extremely long. Therefore, during May, the larvae in the plants are big up to 3 mm, but also larvae bigger than 10 mm were found. The larvae have 3 instars and their development lasted during the spring and summer's months. The first pupae were registered already in the begining of September.

The first injures on *C. achanthoides* caused by the *C. corydon* larvae were registered in nature in the second decade of April on the young shoots. In this period the larvae injured the young shoots due to which irregular lateral shoots are formed. The mature larvae make long tunnels trough the central parts of stems of a feeding plant and sometimes the tunnels goes up to the lower parts of rosettes or, more often, caused serious injures of the flower shoot's armpit which goes from the main stem.

The severity of attack and the population density of *C. corydon* on *C. achanthoides* in central part of Serbia was very high in 1988—1989. (66%, i.e. 77% of attacked plants per year, respectively, average: 2,91, i.e. 3,22 larvae per plant, respectively). Even 6 larvae of this useful insect could be found per a plant.

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INVESTIGATIONS OF THE PRESENCE AND CONTROL OF VECTORS OF *BYDV* IN CROATIA

by

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Summary

A short review of literature concerning some data on *BYDV* especially in neighbour-countries and Yugoslavia is given. A more detailed review of vectors of *BYDV* is given also. Literature data of the presence of aphids on cereals in Yugoslavia are cited.

Own investigations were made by collecting aphids on plants and by using Agraphid. A total of 11 species were found on cereals: *Rhopolosiphum padi* L., *Sitobion avenae* F., *Metopolophium dirhodum* Walk., *Rhopalosiphum maidis* Fitch., *Rhopalosiphum insertum* Walk., *Metopolophium festucae* Theob., *Macrosiphum euphorbiae* Th., *Tetraneura* sp., *Anoecia corni* F., *Schizaphis graminum* Rond. and *Macrosiphum (Sitobion) fragariae* Walk. On maize the following species were found: *Rhopalosiphum padi* L., *Sitobion avenae* F., *Metopolophium dirhodum* Walk., Aphis fabae Scop., *Rhopalosiphum maidis* Fitch., *Metopolophium festucae* Theob., *Rungsia maidis* Pass., *Macrosiphum euphorbiae* Th., *Tetraneura* sp. and *Anoecia* sp.

The most numerous species were *Rh. padi, S. avenae* and *M, dirhodum* which we suppose are the main transmitter of *BYDV* in Yugoslavia.

They are active from April untill November. In all years of the period 1987—1990 many *Rhopalosiphum padi* were found on plants or caught by Agraphid in autemn after the appearance of winter cereals. A greater number of Sitobion avenae was found or caught in autemn only in the year 1990. This autumnal activity is very imporant for transmitting *BYDV* from maize and other host plants to new crops of winter

cereals. It has to be pointed out that in Yugoslavia, maize and cereals are the most important crops covering until 80% of average.

In insecticide trials both systemic OP insecticides (methyl-demeton, monocrotophos), so as a contact OP insecticide (piridafention) were effective. High efficiency was achieved by all pyrethroids used: beta-cifluthrin, bifenthrin, deltamethrin, esfenvalerat so as with the new insecticide imidaclopirid. The combination of cypermethrin and chlorpyriphos so as the systemic aphicide pirimicarb were highly effective also.

The efficiency on maize depends entirely of the application method used.

Zaštita bilja, Vol. 41 (4), br. 194: 379—386 (1990), Beograd

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UDC: 632.951 : 633.15
AGRIS: H00 0120
Original scientific paper

EVALUATION OF FOUR YEAR TRIALS WITH ANDALIN DC-25 (FLUCYCLOXURON) TO CONTROL THE EUROPEAN CORN BORER (OSTRINIA NUBILALIS) IN MAIZE

The initial and persistent effect of flucycloxuron DC — 25 at dosages of 200, 400 and 600 ml of product/ha were studied in controlling the first generation of ECB *Ostrinia nubilalis* in grain maize production in 1986, 1987, 1988. In 1989 the investigation included the first and second ECB generations in sweet corn planted at regular time and as a second crop, respectively. Small and large-scale trials were conducted under artificial plant infestations and naturally occuring ECB, respectively. In grain maize production significant yield increases were obtained in comparison with untreated, but artificially infested control, which was approaching check Galition G 5. Therefore, flucycloxuron can be recommended for successful maize protection from the ECB at a rate of 400 ml of product/ha.

Introduction

The new acaricide flucycloxuron is a benzoyl-phenylurea compound, wich can be classified as an insect growth regulator (IGR) with insecticide and acaricide effects. Flucycloxuron has been shown to have ovicidal and larvicidal/nymphicidal effect. Effects on fully grown larvae may result in pupal malformation. Adulticide effects have not been reported. Its efficacy on insects is mainly due to its activity as a stomach poison. Due to its relatively slow mode of action, an application earlier than conventional insecticides is required to obtain successful insecticide effect. For a full expression of its activity ample time is required between application and evaluation of its efficacy.

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HOST SPECIFICITY AND MORPHOLOGICAL VARIATION IN EPITRIMERUS TARAXACI LIRO (ACARIDA: ERIOPHYOIDEA)[1])

Morphological characters of *Epitrimerus taraxaci* Liro from Yugoslavia were analysed and some of them compared with original description (Finnish local population) and the descirption of the Polish local population. Differences between them were found. Intraspecific variation in almost all analysed morphometric characters was law. Experiments done with five plant species including a host plant showed that *E. taraxaci* can reproduce only on discs of its true host plant, i.e. *Taraxacum officinale Web.*

Introduction

Eriophyids are exclusively phytophygous and they are also among the most important plant feeding mites damaging cultivated as well as wild plants. They generally have a narrow host range. This conslusion is mainly based on detection frequency of these mites on certain plants Only a few experiments confirm this hypothesis (Careshe and Wapshere, 1974, Boczek, 1974, Lipa, 1976, Cromroy, 1979, Easterbrook, 1978, 1979, 1980, Boczek et al., 1984 and so on.). Also for many genera, especially *Epitrimerus*, there exists an interspecific similarity. In case of such fenetic interspecific similarity inspite of generalised conclusion of eriophyid narrow host range more extensive morphometric analysis and host specificity tests should be done.

Epitrimerus taraxaci Liro inhabits the leaves of *Taravacum officinale* Web., a very common Eurasian plant, causing discoloration and russeting. Until now it has been registrated in Finland (Liro, 1943), Sweeden (Roivainen, 1950), Poland (Boczek, and Kropczynska, 1965, Boczek, and Chyczewski 1977) and Yugoslavia (Petanović et al., 1983).

Previous analysis (Petanović, unpublished) showed that 5 species i.e. *Epitrimerus boczeki Natchejf* (host plant *Capsicum annuum* L.), *E.*

[1]) Paper was presented at VII Int. Symp. Biol. Contr. Weeds, 6—11 March 1988, Rome, Italy.

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MONOPHAGIA OF PEA WEEVIL *(BRUCHUS PISORUM* L. *COLEOPTERA, BRUCHIDAE)*

by

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S u m m a r y

The pea weevil *Bruchus pisorum* L. is a highly specialized species. Sixteen species and one subspecies from the *Leguminoseae* family were investigated.

Ovaries in the newly emerged females and in the females which fed on the flowers of soybean, chickpea, white lupin, decorative pea, red and dutch clover, bird's trefoil and alfalfta, were very poorly developed and the ovarioles were thread-like without any sign of the developing ova.

Whe the females fed on the flowers of chickling vetch, chickling, bean and horse bean, there was a slight increase in size of the ovarioles (germarium) but no initiation of ova occurred.

Only when the females fed on pea pollen (pea for human consumption and cowpea) did the ova develop normally and the ovarioles become mature.

In the investigation of oviposition behaviour, the females with mature ovaries oviposit only on the surface of pea pods. The first instar larva does not bore into the wall of any pod other than pea pods.

The results show that the pea weevil develops it's whole life cycle only on pea *Pisum sativum sub. sp. sativum* and *Pisum sativum sub. sp. arvense.* None of the other plants from the *Leguminoseae* family provided favourable conditions for feeding, vitelogenesis and oviposition.

SPREDING OUT OF SHARKA VIRUS BY PLUM AND APRICOT PLANTING MATERIAL

by

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Summary

During 1989. and 1990. the infection intensity of sharka virus in plum and apricot nurseries was investigated in 14 localities in Serbia. The occurrence was studied on the basis of two observations during both years. The extent of infection plum planting material in 1989. was from 0,25 — 41,64% and in 1990. it was from 0,00—5,86%. The level of infection in apricot nursery plants in 1989. was from 2,02—14,37% and in 1990. from 0,13—4,53%. Nursery plants which had showed characteristic simptoms were excluded and distroyed.

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(Primljeno 15. 12. 1990)

BACTERIAL SPOT AND BLIGHT OF CORIANDER

by

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Summary

From coriander diseased plants more thai 28th nonfluorescent bacterial strains of white colonies were isolated. Their pathogenicity were proved on young coriander plants artificialy inoculated under the green house conditions.

The isolates investigated (Ko-1, Ko-2, Ko-6, Ko-7 and Ko-8) caused HR in tobacco, and Pelargonium leaves as well as on string bean pods. Based on the preliminary investigations, using pathogenicity and Lopat tests, it can be supposed that the bacterial strains, isolated from coriander plants in Yugoslavia, belong to the Ia group of pathogenic Pseudomonads, without ability to produce fluorescent pigment on King B medium.

BACTERIOLOGICAL CHARACTERISTICS AND PHYSIOLOGICAL RACES OF *PSEUDOMONAS SYRINGAE PV. GLYCINEA* (COERPER) YOUNG, DYE ET WILKIE AS PARASITE OF THE SOYBEAN

by

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S u m m a r y

Bacterioses are very frequent and common diseases of the soybean in SAP Vojvodina.

The isolates of bacteria were obtained by isolation from the infected soybean plants on nutrient-medium (NA). Their development on the NA was characterized by the occurrence of tiny, roundish and witish colonies. The bacterium are aerobic, rod-shapes, asporogenous and gramnegative. All isolates produced fluorescent pigment on King B medium. The results of LOPAT tests showed that the investigated isolates produced levan and induce hypersensitive reaction in tobacco, but oxidase arginine dihydrolase and potato rot were negative. Catalase was positive. The bacterium produced acid from arabinose, glucose, manit, manose and suchrose. Production of H_2S, indol and reduction of nitrate to nitrite was negative. Investigated bacteria didn't dissolve gelatine and didn't hydrolize starch and aesculine. Production of syringomicin was negative also.

These isolates caused angular, watersoaked spots and chlorosis on inoculated leaves of young soybean plants.

On the basis of the obtained results, it was shown that the investigated isolates from soybean plants, belong to the bacterium *Pseudomonas syringae pv. glycinea.*

In the population of bacterium *P.s.pv. glycinea,* the presence of many physiological races is confirmed. The isolates S-1 and S-64 belong to the race 4, but isolates S-49 expresses the most similarities with the race 5, differing only in few properties (tab. 1).

CONTRIBUTION TO THE STUDY OF STRING-BEAN AND BEAN SUSCEPTIBILITY TO *PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA* (BURKHOLDER) YOUNG, DYE ET WILKIE

by

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Summary

The susceptibility of different string-bean and bean genotypes to *Pseudomonas syringae pv. phaseolicola*-race 2 (B a l a ž, 1985, 1989) was studied in the glasshouse and field conditions (tab. 1—4).

In the glasshouse (tab. 1) the most of genotypes are very susceptible (Harvester, Gallatin, Niagara, Blue lake, Picker, Processor, Amboy, Tendergeen, Tenderlong, Top crop, Zlatna olovka, Dynamit, Goldjuwel, Palanačka rana, L_{15}, Bor. Kis. i Oplenac). In these genotypes: large, translucent, watersoaked spots with chlorotic »halos« occurred on leaves inoculated by spraying with atomizer and heavy systemic chlorosis spread over newformed young leaves. The occurrence of smaller, watersoaked spots with the stained bacterial exudate on inoculated leaves (Koralle, Wav 385, Jaguar, Panonka and L_1) indicates the reduced susceptibility; although some other factors can cause smaller spots also. Two types of spots (smaller ang large) occurred most frequently on inoculated leaves of Biser variety. In the resistant varieties (NZ 5279 and Oreol) very smal, brown, opaque, spots, recessed in tissue occurred on inoculated leaves (tab. 1).

Apart from the reaction of inoculated leaves, the intensity of bacterial spreading through vascular tisues, can influence to the degree of susceptibility of string-bean and bean also. For this reason, the relatively weak infection of leaves, can later cause heavy systemic chlorosis of the plants (Koralle, Wav 385, Jaguar, Panonka and L_1), but in Biser variety, the bacteria spread weakly through inoculated plants. In the NZ 5279 variety, although inoculated mesophille showed typical resistant reaction, in some cases if bacteria infect the veins of the youngest leaves and invade the vascular tissues, systemic chlorosi of leave can be caused (tab. 1).

The results of inoculation trials on leaves of string-bean and bean obtained in the glasshouse, are in accordance, with few exception, with the results of the susceptibility of leaves and systemic chlorosis of inoculated plants in field experiments (tab. 1 and 3).

Inoculation by pricking of pods in the glasshouse showed that the most of the investigated genotypes were susceptible (tab. 2). In these genotypes: dark-green, greasy spots with abundant bacterial exudate were formed around the pricked places on the pods. In Biser variety the pods were the least susceptible: small, brown and dry spots occurred on inoculated pods of this variety (tab. 2).

On inoculated plants in field experiments, the most susceptible were the pods of the varieties L_{15} and Harvester, then follow Tenderlong, Gallatin, Panonka, L_1 and others, but the pods of the varieties Bor. Kis., NZ 5279 and Biser, were the least susceptible (tab. 4).

The results of the inoculation trials with pods in the glasshouse and field experiments were gareement in most cases. although there were some exceptions. Namely, susceptibility of inoculated pods of different genotypes observed in the glasshouse, was not confirmed in all cases in field experiments (tab. 2 and 4).

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(Primljeno 30. 12. 1990.)

THE IMPORTANCE OF A NEW APPROACH FOR ANALYSIS OF PATHOGEN POPULATION IN BREEDING FOR RESISTANCE

by

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Summary

In the paper are discussed: Race as a general concept, The pathogenetic race concept in plant pathology, The gene-for-gene relatioship, Implications of Flor's work, and Recent Pathogenic Nomenclatural Systems.

Several alternatives are recommended to be used in breeding for resistance rather than race taxonomy.

1) Recognizing the corresponding gene pair as the unit of variation, rather than race.
2) Using type cultures of parasites to document genetic studies rather than race names. Pathogenicity formulae can be used to describe these type cultures.
3) Reporting pathogenicity survey information in terms of avirulence/virulence frequencies, one differential at a time.
4) Reporting pathogenicity survey information in terms of pathogenicity associations to two or more differentials taken in all possible combinations.
5) Using uniform rust nurseries, rather than pathogenicity surveys, as a basis of determing usefulness of particular host materials.
6) Emphasizing research on the basis of parasite: host environment genetics specificity, we need to manipulate the host units rather than attemping to name all the variants in the pathogen population.
7) It is necessery to use the broad range of host genes available in disease control. Broadbased germplasm evaluation should be a major objective of specificity studies.

by

REVIEW OF INVESTIGATIONS OF *ERYSIPHE GRAMINIS TRITICI* POPULATION IN YUGOSLAVIA

by

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Summary

Two periods of research of Erysiphe graminis tritici population could be distinguished so far in Yugoslavia: period when a set of wheat differentials has been used, and the one when series of Pm genes has been substituted for the aforementioned et.

Investigations have taken place mainly in three institutes: Institute for Small Grains (Kragujevac), Institute for Field and Vegetable Crops (Novi Sad), and Institute for Breeding and Growing of Field Plants (Zagreb).

First data on physiologic races in the country were reported by Smiljaković (1966). **Until now 70 races have been identified: 0, 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32. 33, 34, 35, 36, 39, 40, 41, 42. 43, 44, 45, 46, 47, 49, 51, 52, 53, 54, 56, 57, 58, 59, 60, 62, 64, 65, 67, 69, 71, 72, 73, 74, 75, 80, 81, 82, 84, 85 and 86. (Smiljaković, 1966; Stojanović et. al., 1973;** Špehar and Vlahović, 1078; Stojanović and Andrejić, 1978; Vlahović et. al., 1979; Kostić and Pribaković, 1981; **Stojanović, 1982; Korić, 1984; Kostić and Pribaković, 1985; Stojanović and Ponoš, 1988; Dopuđa, 1989;** Korić, 1989).

Periodical race changes were closely related to the wheat cultivars grown widely in the meantime.

The identification of some mildew isolates was impossible, being the infection types on the differentials did not fit those marked in the international key.

From 1975 research of virulence population of mildew is based on **five Pm genes- Pm 1, Pm 2, Pm 3a, Pm 3b, Pm 3c, and Pm 4 (Briglle, 1966) and later on additional six genes- Pm5, Pm6, Pm7, Pm8, Pm9 and Mld** (Kostić and Pribaković, 1981, 1985; Stojanović, 1982; Stojanović and Ponoš, 1989, 1990).

Virulences V1, V5 and V7 have shown the highest frequency. It is difficult to explain such a rank of V7 being the gene Pm7 owes its origin from ruy. The most of the fungus genotypes have in possession two or three virulence genes what is the indication of medium virulence of Yugoslav populatoin of mildew fungus. The highest percent in the mildew population belongs to the genotypes with virulence formulae (A/V), 2, 3b, 4/1, 3a, 3c and 3b, 4/1, 2, 3a, 3c.

For the analysis of mildew virulences now are being used mobile nuresies as well (Jevtić et. al., 1990).