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# **Z A Š T I T A B I L J A**

## **(PLANT PROTECTION)**

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C O N T E N T S

Scientific papers

V. Lazarev

Bioecological features of *Lophodermium* spp. on twoneedle Pines in Bosnia — — — — — 27

P. Marinković, J. Popović

Phytotoxic effects of *Fusarium oxysporum* var. *orthoceras* f. *pini* metabolites on embryos of *Pinus nigra* Arn. — — — — — 33

U. Islam, A. Marić

Contribution to the studies on biology, epidemiology, and resistance of sunflower to *Alternaria helianthi* (Hansf.) Taub. Nish — — — — — 48

A. Serafimovski

Some observations on the evolution of fall webworm (*Hyphantria cunea* Drury) in the surroundings of Skopje — — — — — 57

M. Jovanović, N. Dimić

Contribution to the knowledge of leaf miners on clover and alfalfa — 67

Č. Sidor, V. Grbić

Diseases of red mite (*Panonychus ulmi* Koch) provoked by microorganisms in region of Vojvodina (Yugoslavia) — — — — — 75

V. Vojinović, I. Perić, N. Nešković, M. Drlić

Content of lindane residues in soil and plant parts of stubble-field crops after its application in wheat as the main crop — — — — — 82

Professional papers

M. Sestović, I. Perić, R. Kljajić

Resistance as a factor in the chemical control of harmful organisms — 94

Reviews

M. Arsenijević

Bakterialjne bolesti lesnih drvećnih porod — — — — — 95

Bakterialjne bolesti rasteni — — — — — 95

— sa praktičnog stanovišta zaštite značajan je samo period masovnog rasijavanja askospora kada se ostvaruju i masovne infekcije, dok infekcije izvan tog perioda imaju sporadičan karakter. Koncentrisanom aplikacijom fungicida u tom periodu moguće je obezbjediti gotovo potpunu zaštitu iglica od infekcija patogenih.

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#### BIOECOLOGICAL FEATURES OF *LOPHODERMIIUM* SPP. ON TWO-NEEDLE PINES IN BOSNIA

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#### Summary

Bioecological features of *Lophodermium* spp. in Bosnia were studied on primary and secondary needles of *Pinus sylvestris* and *P. nigra* var. *austriaca*. We found differences in morphology, anatomy, ecology, life cycle and pathogenicity among these fungi. On primary needle of one year old seedlings the most important is *L. seditiosum* which colonize a few months old needles. However, *L. pinastri* as less virulent species usually colonize first needles which are physiologically weakened and never cause dieing of seedlings.

On secondary needles both *Lophodermium* species could appear. *L. seditiosum* on one year and two years old needles, while *L. pinastri*

only on two years and older needles. There were some differences in morphology of these species on primary and secondary needles. However, their isolates are the same typical of each *Lophodermium* species.

Life cycle of these species is quite different. Dissemination of ascospores of *L. seditiosum* and critical infection period last from middle august to october, while dissemination of ascospores of *L. pinastri* last from may to july.

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**PHYTOTOXIC EFFECTS OF FUSARIUM OXYSPORUM  
VAR. ORTHOCERAS F. PINI METABOLITES ON  
EMBRYOS OF PINUS NIGRA ARN.**

The freed embryos of Austrian pine were exposed to the action of toxic products of metabolism of the fungus by being immersed in the filtrates of cultures. The phytotoxic effects were established on the bases of embryos growth, weight increment, pigmentation intensity, expansion of root zone and opening of cotyledons. The degree of phytotoxic action was proportional to the production of toxins and these effects are manifested through the reduced growth of embryo, incapability to form root cap and cotyledons.

*Fusarium* species can cause considerable damage to the production of forestry nursery stock, since their action prevents germination of seed and development of young plants. *Fusarium oxysporum* var. *orthoceras* f. *pini* is a distinctly pathogenic species which causes seed-decay and damping off Austrian pine saplings (P e n o, 1968).

In the course of metabolic processes in fungi, toxic metabolites are synthesised, which affect biochemical processes essential to the life of plant and thereby create conditions for the occurrence and development of diseases. According to the available data, the *Fusarium* species also synthesise toxic metabolites. A large number of these metabolites has been identified so far, but their action has been investigated mainly on crops. The effects of toxic metabolites on plants related to forestry trees has been inadequately studied. Hence the reasons for conducting an investigation into phytotoxic effects of *Fusarium oxysporum* var. *orthoceras* f. *pini* fungus on embryos of *Pinus nigra*.

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## CONTRIBUTION TO THE STUDIES ON BIOLOGY, EPIDEMIOLOGY AND RESISTANCE OF SUNFLOWER TO ALTERNARIA HELIANTHI (HANSF.) TAUB. NISH.

In this paper are presented the results of the studies of the role of a toxin like metabolite of the fungus in pathogenesis of the disease, overwintering of the parasite, the influence of different meteorological factors on the development of the disease and different problems of sunflower resistance to *A. helianthi*.

### Production of a toxin by the fungus

In our previous work (Islam and Marić, 1978), we pointed out that *A. helianthi*, along with other symptoms, causes premature wilting of infected sunflower plants, which indicates the possible production of toxin like metabolites by the fungus.

In order to study this question, *A. helianthi* has been grown in Richards, Czapek, Dox and Malt liquid media. Inoculated media were kept in an incubator at 24°C for an period of 45 days. Only malt liquid media was used in further experiments because it was the most suitable for fungus growth. The culture was filtered and filtrate obtained was used to assay the toxin production, by assesment of the inhibition of seed germination (Ludwig, 1955) and root elongation (Luke and Wheeler, 1955).

Sunflower seed was soaked for 24 hours in the culture filtrate and then placed on filter paper in Petri dishes. Three ml of the filtrate with various concentrations was added to the filter paper. Five replications were maintained for each treatment with 10 seeds in each dish. Seeds soaked in uninoculated media and sterile water served as control.

Influence of cultural filtrate on root elongation was studied on seedlings after germination in sand. Ten seeds with about 1 cm root length were placed on filter paper moistened with 3 ml of cultural filtrate of various concentrations in Petri dishes. Filter paper moistened

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SOME OBSERVATIONS ON THE EVOLUTION OF FALL WEBWORM  
(*HYPHANTRIA CUNEA* DRURY) IN THE SURROUNDINGS OF SKOPJE

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After almost 20 years of standstill, *H. cunea* Drury starts a new incursion into the southern parts of our country. At the end of summer 1975 it was observed for the first time in the surroundings of Skopje, and as early as in 1977, 1978 were discovered its new focuses in other parts of Macedonia (surroundings of Kumanovo, Strumica, Prilep).

In the surroundings of Skopje it manages to develop 2—3 generations a year and to pass into the winter diapause in the pupal stage. Caterpillars moulted 5 times, i.e. they develop in 6 stages. The total development of caterpillars lasted from 34 to 38 days. The female moths lived 4.9—6.8 and the male ones 4.2—5.9 days on an average. The fertility of females varied about 350 eggs, which were deposited chiefly in 1—2 eggs clusters. The caterpillars fed on several fruit, forest, horticultural and truck farming plant species. The II and III generations were markedly voracious.

Further investigations of Fall Webworm in this Republic are in progress.

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#### CONTRIBUTION TO THE KNOWLEDGE OF LEAF MINERS ON CLOVER AND ALFALFA

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#### S u m m a r y

In the course of long term studies (1962—1978), performed on the territory of the S.R. Bosnia and Hercegovina and the S.R. Serbia, high number of species of leaf miners on clover and alfalfa has been recorded. Among the species which were found the most numerous were those from the family *Agromyzidae* (Diptera): *Agromyza nana* Mg., *A. frontella* Rond., *Liriomyza trifolii* Burg., *L. strigata* Mg. and *Phytomyza horticola* Gour., but the only one species belongs to the family of *Lepidoptera* — *Lithocolletis insignitella* Z.

The leaf miners on the clover and alfalfa were widespread and recorded on 46 localities (the some number in both Republics). Some species were found in high numbers and caused harmful effects. Among these species *Agromyza nana* and *A. frontella* on the clover and alfalfa were economically very significant. In the locality of Kruševac the best control of these pests could be achieved by the treatment with Sistemine and Ekatine in 0.1—0.2% concentrations.



U našem programu daljeg rada na ispitivanjima oboljenja *P. ulmi* nalaze se zadaci koji treba da detaljnije obrade svako od pomenutih oboljenja.

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#### DISEASES OF RED MITE (*PANONYCHUS ULMI* KOCH) PROVOKED BY MICROORGANISMS IN REGION OF VOJVODINA (YUGOSLAVIA)

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#### Summary

Results obtained by examinations of red mite (*Panonychus ulmi* Koch) show that this mite pest suffers and dies of several diseases caused by microorganisms. It has been stated that red mite in Vojvodina (north part of Yugoslavia) are affected by rod shaped noninclusion virus. Besides that in dead mites were also found polyhedral inclusions

with spherical bodies (possible virus) 60  $\mu\text{m}$  in diameter, as well as microsporidia (*Nosema* sp.) and fungi *Entomophthora* sp.

Dense orchard populations of *P. ulmi* in Vojvodina were most often affected with noninclusion virus, at the second place by mycoses and at the third by polyhedral inclusions. Microsporidia were found only in 1—2% of *P. ulmi*.

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CONTENT OF LINDANE RESIDUES IN SOIL PLANT PARTS OF  
STUBBLE-FIELD CROPS AFTER ITS APPLICATION IN WHEAT  
AS THE MAIN CROPS

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Summary

In order to examine the possibility of growing the on crops stubble-field after the application of lindane in the main crop, the residues of this insecticide were determined in soil and plant parts of forage beet, red beet, rape, carrot, tobacco and potato, on lindane treated areas at the time of wheat sowing. Parallel examinations of samples from the areas watered with artificial rain and from non-watered areas were carried out.

In all samples of soil (taken from the depth of 0—45 cm) were found lindane residues in the amount not exceeding 5,0 ppb. The content of lindane found in all analysed plant parts were far below the allowed amounts according to Yugoslav regulations.

**RESISTANCE AS A FACTOR IN THE CHEMICAL CONTROL OF  
HARMFUL ORGANISMS****M. Šestović, I. Perić, R. Kljajić**Faculty of Agriculture-Department for Pesticides, Zemun;  
INEP — Department for pesticides, Zemun.**Summary**

Knowing resistance to be a general biological phenomenon and a way of adaptation of living organisms to changed environmental conditions, in respect to genesis there are outstanding differences between this occurrence and the so-called natural tolerance.

Special attention is being paid to the resistance problem of insects, mites and plant pathogenic fungi and the possibility of other harmful organisms developing resistance is being considered as well.

It is being stressed that high resistance is due to some genetic factors and that it may be monogenous, poligenous, dominant and recessive. Special attention is being paid to the occurrence of cross and multi resistance, to the factors which cause them, and to their practical implications.

Pointing out that the mechanism of resistance has a direct dependence on the acquaintance with the mechanism of pesticide action, the processes of permeability reduction, detoxication increase, affinity reduction of the site of action to pesticide molecules, and so on, are being closely observed.

There is a special stress being put on the future development of resistance, its implications (economic and other), and a concept with the aim of overcoming these occurrences is being proposed, while from the aspect of the entire problem concerning resistance, the possibilities of further promoting pesticide application are being considered.