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INSTITUT ZA ZAŠTITU BILJA I ŽIVOTNU SREDINU - BEOGRAD  
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# ZAŠTITA BILJA PLANT PROTECTION

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(Primljeno 19.05.1993.)

## THE APPLICATION OF ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA) IN PROVING OF *ERWINIA CAROTOVORA* SUPSP. *ATROSEPTICA*, A POTATO PATHOGEN

by

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### Summary

From the total number of 13 investigated strain of bacteria, isolated from the diseased plants and potato tubers, 9 strains react positively in enzyme-linked immunosorbent assay (ELISA) test (on microplates), used to prove *Erwinia carotovora* ssp. *atroseptica* (A g d i a inc., 1987). Four strains show the negative result, because they do not react with the antibodies of this bacterium (tab.1).

Filtrated or centrifugated sad, strained from the diseased potato tissue, also manifested the positive effect in the invaginations ("pools") of microplates. The positive result was obtained by using the autentic strain of *E.c.ssp.atroseptica* (P-14/1), used as positive control.

The negative reaction with the antibodies of *E.c.ssp.atroseptica* manifested the strains of the bacteria *E.c.ssp.carotovora* (P-2092), *E. chrysanthemi* (E.chr.8263/2) and *P.s.pv syringae* (96A/2), applied as negative controls (tab.1).

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## FUNGI OF THE GENUS *Puccinia* ON WEED PLANTS IN SERBIA

by

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### Summary

On 16 weed species 14 pathogens of the genus *Puccinia* were registered. The higher pathogenity to its host plants was manifested by *P. menthae*, *P. suaveolens*, *P. sonchi*, *P. retifera* and *P. xanthii*. All these pharasites cause leaf drying, followed by a decreasing vitality of the diseased plant, by which is prevented their expansion.

With its destructive effect especially stood out *P. suaveolens* on *Cirsium arvense*, which point to the necessity of its more detailed investigation in our conditions. The use of this fungus for biological control of Canada thistle can be restrected by the appearance of the superparasite *Fusarium sporotrichiella* var. *tricinctum*, which destroys pycnia, uredinia and telia of parasites.

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## INVESTIGATION ON ANTAGONISTIC EFFECT OF SAPROPHYTIC BACTERIA AND FUNGI TO *AGROBACTERIUM TUMEFACIENS*

by

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### Summary

In this paper it was investigated antagonistic effect of bacteria and fungi to *Agrobacterium tumefaciens* (Smith and Townsend) conn, a grapevine parasite.

The isolation of 10 strains of bacteria *Agrobacterium tumefaciens* from the diseased grapevine tumor from the locality of Velika Drenova was carried out in the course of 1988/89. From the same ground the saprophytic bacteria and fungi isolation was carried out. After that, the antagonistic effect of bacteria - by the method of small wells and fungi by disk block agar method, to *Agrobacterium tumefaciens*, with the control of the ecological factors (temperature, medium and age of investigated fungi cultures).

Among the saprophytic bacteria the antagonistic effect was manifested by the species *Bacillus mycoides* and *Escherichia coli*, and among the fungi: *Rhizopus nigricans*, *Mucor pusillus*, *Penicillium rubrum*, *Alternaria humicola*, *Alternaria alternata*, *Fusarium dimerum*, *Fusarium oxysporum*.

The obtained results proved the former knowledge from this field, but some new data, for our conditions, are also included, which can be also used for practical purposes.

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## INVESTIGATION ON THE POSSIBILITY OF ANTIBIOTIC USE FOR *AGROBACTERIUM TUMEFACIENS* CONTROL

by

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### S u m m a r y

Former knowledge proved the efficacy of the different antibiotics to *Agrobacterium tumefaciens* (Smith and Townsend) Conn.

In our paper ten strains of *Agrobacterium tumefaciens*, were used. It was investigated the effect of seven different antibiotics to these strains: pentrexyll, ceporex, streptomycin sulfat, vibramicin, chymociclar, nistatin, bactrim.

Two methods were used: antibiogram method and medium cut method. In both the methods the most efficient was streptomycin sulfat (tab. 3).

Pentrexyll, chymociclar and bactrim had a moderate effect to the strains *Agrobacterium tumefaciens*.

All the seven antibiotics manifest antagonistic effect, mostly in low concentrations (from 10-1 to 10-4) (tab. 1-7).

Among the investigated strains of *Agrobacterium tumefaciens* there is no higher exceptions in the susceptibility to antibiotics. Slightly higher susceptibility is manifested by the strains VL-1 and VL-2.

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INFLUENCE OF TEMPERATURES ON THE SPORULATION OF  
APHIDOPATHOGENOUS FUNGI *PANDORA NEOAPHIDIS*  
(REMAUDIÈRE ET HANNEBERT) HUMBER

by

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## Summary

Entomopathogenous fungi are an important regulators of the population of plant aphids. They are causer of *epizootia mycosis* on aphids on the different cultivated plants during the spring and autumn. The fungi are transmitted per horizontal type and due to this, they depend considerably on the environmental conditions. The presence of favorable environmental conditions during the sporulation is a critical period. Due to this, the aim of this paper has been to prove the temperature influence on the sporulation.

The experiments were set up at the temperatures of 11°C, 20°C, 25°C, 30°C and 36°C in dark conditions and at 20°C at light. All the treatments were with 100% of relative humidity.

The results of the experiment proved that fungus *P.neoaphidis* sporulates at the temperatures from 11°C to 25°C and at 30°C and 36°C it cannot sporulate. *P.neoaphidis* released the largest

number of conidia at the changeable temperatures such were in the field with on average 61.340 conidia per aphid and at 25°C, where was on average 52.110 conidia. The fungus formed the lowest number of conidia at a constant temperature of 11°C, where was on average 24.497 conidia per aphid. If all the conditions of favorable relative humidity and temperature are satisfied, *P.neoaphidis* sporulates at light and in dark as well.

In cabbage agrobiotype the favorable temperatures are present during a long period of aphid presence in cabbage, but they last differently. The fungus sporulates most intensively during the period from 3 to 12 hours from the beginning of the sporulation, which in nature is from 2 to 8 h in the morning, when conidiophore discharges up to 64% of the total amount of conidia. This proves that it needs only one favorable night to discharge the most of conidia. In the constantly favorable conditions the sporulation lasts over 36 hours. In this paper it was proved that the favorable conditions for the sporulation of limited duration, which in our conditions often arise during the summer, can cause the loss of infective inoculum quantity of this fungus.



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**POLISTIGMA RUBRUM DIFFUSION, INTENSITY AND DISEASE DYNAMIC  
AT THE TERRITORY OF THE REPUBLIC OF SERBIA**

by

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**S u m m a r y**

*Polystigma rubrum* (Pers.) D.C. is very diffused plum parasite in Serbia. In all the localities in the course of 1986-1988 and 1990-1991 it was registered the appearance of this fungus (table 2). During 1986 the plum orchards with the disease intensity of 20-50% prevailed. In 1987, in the most plum orchards, the intensity ranged from 20 to 40%, and in 1988, 1990, and 1991 in the most localities it was 10%.

The disease intensity lower than 10% can be evaluated as weak attack, 11-25% as middle, 26-50% as strong and over 50% as very strong attack.

On the diseased leaves of the plum, it was registered up to 75 stroma per leaf in 1986, up to 45 in 1987, up to 46 in 1988, up to 9 in 1990 and up to 5 stroma per leaf in 1991. In the first two years it was mostly 1-5 and 1-3 stroma per leaf respectively, and in 1988, 1990 and 1991 the leaves with only one stroma prevailed.

Investigating the disease growth during the vegetation (table 3), it was proved the insignificant increase of disease intensity, although the number of stroma per leaf did not increase significantly, which is the result of the enlargement of the existing stroma of *P. rubrum*, and not of new infections.

## INVESTIGATING ON THE TOXITY OF DIFETIALON FOR *RATTUS NORVEGICUS* BERK. IN LABORATORY CONDITIONS

by

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### S u m m a r y

The researches of the acceptability and the toxicity of difetialon (1,25 g/l, producer "Rousel Uclaf", France) in Baraki baits, prepared in pellets and parafine blocks, carried out on the white laboratory rat, *Rattus norvegicus*, of the species Wistar, with once occurring and repeated treatment.

The obtained results in laboratory conditions showed that with once occurring and repeated treatment, Baraki baits in parafine blocks are more acceptable for *R. norvegicus* than the baits prepared in pellets.

With once occurring use of Baraki pellets, the animals consumed on average 13,1 g. The first symptoms of poisoning of all animals appeared after 4 days, and the mortality began between the 6th and the 9th day.

The toxicity of difetialon and the acceptability of the baits prepared in parafine blocks for *R. norvegicus* with once occurring and repeated use is more expressed than of the bait in pellets. The Ratus fed once, consumed on average 32,5 g of baits, and the loss of the body mass was on average 6,2 g each. The first symptoms of poisoning appeared also after 4 days, and they did between the 5th and the 6th day. With repeated feeding, seven-days exposure of Baraki baits prepared in parafine blocks, animals consumed on average 74,5 g each, the loss of the body mass per individual was on average 25 g. The first symptoms of poisoning appeared after 4 days, and the mortality began between the 6th and the 7th day.

## EFFICIENCY OF THE CONTROL OF RODENTS IN PUBLIC OBJECTS AND ON ALFALFA BY BARAKI BAIT (DIFETIALON)

by

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### Summary

It was researched the possibility of the control of rodents in public objects (*Rattus norvegicus*, *R. rattus* and *Mus musculus*) and on alfa-alfa (*Microtus arvalis* and *Apodemus sylvaticus*) with the Baraki baits (a.m. difetialon).

The testing of Baraki bait with active component of difetialon (1,25 g a. m/l, producer "Rousel Uclaf"), showed that the efficiency against *R. norvegicus* and *R. rattus* in the mixer of fodder, is satisfactory. Slightly higher acceptability and efficiency was obtained with the baits prepared in parafine blocks, in relation to the bait in Baraki pellets.

The results showed that the efficiency of difetialon prepared in parafine blocks for rat control in the mixer of fodder, was 83,7%. The largest quantity of the eaten bait was the first day (319 g), the second (229 g), the third (154 g) and the fourth day (197 g). After that, the quantity of the consumed bait decreased and the tenth day it was only 21 g. The efficiency of difetialon prepared in pellets for rat control was 82,9%. Larger quantity of the baits was consumed the first day (241 g), the second (198 g) and the third (171 g). After that, the quantity of the consumed bait decreased and the tenth day it was only 36 g.

The check of the acceptability and the efficiency of difetialon prepared in Baraki pellets and parafine blocks for *M. musculus* in a restaurant, shows that in the interval of eight days 107 baits in pellets and considerably more baits in parafine blocks (164 g) were eaten. The efficiency in suppressing of *M. musculus* of 62,5% for pellets and 79,2% for parafine blocks was obtained.

On alfalfa, where the experiments were taken place, it was outbreak numerousness of the rodents. On the experimental plots of 100 m<sup>2</sup>, from 102 to 152 active holes were registered, and from 204 to 304 individuals, respectively. The number of occurrence of the species was: *Microtus arvalis* Pall. 69% (87 individuals) and *Apodemus sylvaticus* L. 31% (39 individuals).

The efficiency of difetialon prepared in pellets for rodents control in alfalfa was satisfactory. The efficiency obtained by applying in the period of 7 days was 84,6%. But difetialon in parafine blocks, showed considerably higher efficiency (94,7%). Considerable decreasing of the number of rodents was the first day (86,8%). Suitability of the parafine blocks, besides higher efficiency, is also in the fact that they can be used in the conditions of high humidity (immediately after atmospheric rainfall).