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LITERATURA

- Bej-Bienko, G. Ja. i dr. (1949): Sel'skohozjajstvenaja entomologija, »Sel'hozdziz«, Moskva—Leningrad.
- Dorohov, S. A. (1965): Praktičeskoe rukovodstvo po borbe s vrediteljami r'bnih produktov, Moskva.
- Eremenko, V. M., Brudnaja, A. A., Menšova, L. P. i dr. (1967): Rukovodstvo po bor'be s vrediteljami hlebnih zapasov, »Kolos«, Moskva.
- Grosu, S. (1975): Sos. Stefn. cel Mare Nr. 19—21, Bucuresti 10, Rom, Studi cercet biol. 27 (4): 327—329.
- Hamlin, J. C., Reed, W. D. and Philips, M. E. (1931): Biology of the Indian Meal-moth on dried fruits in California. Technical Bulletin No. 242, 1—24.
- Popov, V. Iv. (1939): Skladovi nas'komi v'B'lgaria i borbata s'tjah, Sofija.
- Popov, V. (1961): Skladovi neprijatel i borbata s'tjah, Sofija.
- Rumjancev, P. D. (1959): Biologija vreditel'jev hlebnih zapasov, Moskva.
- Savov, D. I. (1973): Molec po sušenite plodove *Plodia interpunctella* Hb. (*Lepidoptera, Pyralidae*) biologija, ekologija i sredstva za borbu. (Doktorska disertacija.) Sofija.
- Šorohov, P. I. i Šorohov, S. I. (1936): Ambarnie vrediteli i mery bor'by s nimi, »Sel'hozgiz«, Moskva.
- Tzanakakis, M. E. (1959): An Ecological Study of the Indian Meal-moth, *Plodia interpunctella* (Hubner) with Emphasis on diapause. *Hilgardia*, Vol. 29, No. 5, 205—246.
- Vukasović, P., i dr. (1964): Štetočine u biljnoj proizvodnji, I opšti deo, Beograd.
- Vukasović, P., Glumac, S. (1967): Uticaj hrane na plodnost i dužinu života pasuljevog žiška (*Acanthoscelides obtectus* Say.), *Zaštita bilja*, br. 93—95, Beograd.
- Zacher, F. (1927): Die Vorrats- Speicher- und Materials- chadlinge und ihre Bekämpfung, Berlin Verlagsbuch hand lung, Paul Parey.

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INFLUENCE OF FOOD ON THE FECUNDITY AND FERTILITY OF
INDIAN MEAL — MOTH (*PLODIA INTERPUNCTELLA* Hbn.)
(*LEPIDOPTERA, PHYCITIDAE*)

by

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Summary

On the basis of the dissection of the Indian meal-moth female reproductive system it has been stated that after eclosion of the females there have not been eggs in their ovarioles, and than the very quick development of vitelogenous eggs in the ovarioles. The most of the vitelogenous eggs were found in the female ovarioles that had been fed on maize and sunflower. The most of them have been formed within 0—4 hours after eclosion. The smaller number has been formed within the following 4—24 hours.

Twenty-four hours after eclosion, the females deposit eggs. The oviposition lasts 2—13 days depending on the individual. Eggs are deposited daily, although we noted the shorter pauses in egg deposition. The females having greater fecundity (where caterpillars used maize and sunflower as their food) deposited their eggs for the longer period of time than the females with the lower depositing capacity (they are found with caterpillars fed with kale and what). The most of the eggs were deposited during the third, the fourth and fifth day of the female life. The most favourable food for the Indian meal-moth has been sunflower, where the females deposited 217 eggs, and the fecundity is nearly even to the fertility (221). There are great individual differences in the number of the deposited eggs between the individuals whose caterpillars were fed with the same nutrient.

The most favourable food is maize and sunflower as the most of the coming generations appeared on this kind of food and, it is in accordance with the natural conditions as this pest appears in the most frequently on maize and sunflower.

INITIAL COMMUNITIES OF ARTHROPODA POPULATIONS ON
DEPOSOL IN RECULTIVATION WITH ALFALFA IN
THE REGION OF KOSTOLAC

by

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S u m m a r y

Initial communities of insect populations and other arthropods are being formed in the first year of alfalfa cultivation on deposol (technically prepared barren soil) in the region of Kostolac. The insect population is poor, including only a small number of species (19), while the number of individuals of the estimated species is small. These include generally those species in pursuit of food from neighbouring biocenoses and through food-chains and are included into the newly formed ecosystem. Most species are phytophagous feeding on alfalfa and damaging it, a minority is zoophagous, primarily predators—feeding on other insects, generally aphids.

In the second and third year of alfalfa recultivation, due to an improvement of edaphic conditions, alfalfa coverage and growth, there is an increase in the number of species as well as in the number of individuals.

In the third investigational year 76 insect species were estimated out of 8 orders and 34 families. A majority of species (28) belong to the *Coleoptera* order, 14 to the *Hymenoptera*, 11 to the *Heteroptera*, 9 to the *Homoptera* while a minority belongs to other orders (*Saltatoria*, *Neuroptera*, *Diptera* and *Lepidoptera*). Most abundant are the following orders: *Coleoptera* (34 percent), *Heteroptera* (29 percent) and *Homoptera* (20 percent), other orders being less numerous. Population density in the third year of recultivation in relation to the first is six times greater. In the trophic sense, phytophagous species are predominant. These include some significant alfalfa pests, like *Phytodecta fornicata*, *Subcoccinella 24-punctata*, *Haltica oleracea*, *Apion pisi*, *Tanymecus palliatus*, *Bothynoderes punctiventris*, *Otiorrhynchus ligustici*, *Adelohocoris lineolatus*, *Lygus pratensis*, *Phyllenus spumarius*, *Aphrodes bicinctus*, *Psamotetix alienus* etc.

- Germanov, A. (1982): Development and Behavior of larvae of the Angoumois grain moth (*Sitotroga cerealella* Oliv.). Conditions of mass rearing. — Rastenievadni nauki 19 (5) 87—95. Bulgaria.
- Grewal, S. S. and Ateal, S. (1969): The influence of temperature and humidity on the development of *Sitotroga cerealella* Oliv. (*Gelechiidae*, *Lepidoptera*). — J. Res. Punjab Agric. Univ. 6, 353—358.
- Hammad, S. M., Shenouda, M. M. G., El Deebal (1969): Studies on the biology of *Sitotroga cerealella* Oliv. (*Lepidoptera*, *Gelechiidae*). — Bull de la Societe Entomologique d'Egypte, 51, 257—268.
- Kolektiv autora (1971): Zaštita kukuruza od štetočina, bolesti i korova. — Zadržna knjiga, Beograd.
- Koone, H. P. (1952): Maturity of Corn and Life History of the Angoumois Grain moth. — The Journal of the Kansas Entomological Society, 25 (3), 103—105
- Ilić, B. i Krnjajić, S. (1981): Delovanje fizičkih faktora sredine na razviće žitnog moljca (*Sitotroga cerealella*). — Zaštita bilja 32 (4) br. 158, 401—406.
- Rhine, J. J. and Staples, R. (1968): Effect of high-amylose field corn on leval grown and survival of five species of storedgrain insects. — J. Stored Products, 61, 280—282.
- Slockel, J., Turtaut, P. (1970): Technique délevage pour une obtention massive d'adultes vierges de L'olucite des cereales. — Phytoma 22 (219) 17—20.
- Tanasijević, N., Simova-Tošić, D. (1985): Posebna entomologija. — Poljoprivredni fakultet, Beograd. St. 409—410.

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INFLUENCE OF CLIMATIC FACTORS AND FOOD ON EMBRYONAL AND POSTEMBRYONAL DEVELOPMENT OF ANGOUMOIS GRAIN MOTH *SITOROGA CEREALELLA* OLIV. (LEPIDOPTERA: GELECHIIDAE)

by

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S u m m a r y

In the paper are set forth the results of the study of the influence of temperature and relative air humidity on the duration of embryonal development and on the death rate of fertilized eggs of *Sitotroga cerealella* Oliv., as well as the effect of feeding of caterpillars on the wheat sorts with different grain weights and on the corn hybrids of different ripening groups and, in consequence, off unequal grain size.

The results have shown that the embryonal development of the Angoumois grain moth is the longest at the lowest temperature we had in our experiment (20°C) and at relative humidity of 55 p.c. (it amounts to 7.30 days). At the variable temperature (23—27°C) and relative humidity (60—75 p.c.) and at the constant temperature of 25°C and relative humidity of 55 p.c., the development lasts 6.60 resp. 6.20 days. At the temperature of 30°C, the duration of the development was from 4.20 days at the relative humidity of 45 p.c. to 4.90 days at the relative humidity of 80 p.c.

The global influence of temperature and relative humidity on the hatching of the Angoumois grain moth caterpillars is very great. Under the conditions when eggs were reared at 30°C, with the increase of relative air humidity, there increases also the number of hatched caterpillars. At 45 p.c. humidity the number of hatched caterpillars is but 45.74 p.c. With the increase of the degree of humidity up to 60 p.c., the percentage of hatched caterpillars amounted to 62.04 p.c., whereas under the conditions when the relative humidity was 80 p.c., the number of hatched caterpillars amounted to 72.22 p.c. However, the part of fertilized eggs in the total number of eggs from which the caterpillars had not hatched, was reduced from 37.23 p.c. at the lower humidity to 10.49 p.c. at the relative humidity of 80 p.c. At the variable temperature (27—37°C) and the relative air humidity (60—75 p.c.) the caterpillars have hatched from 77.54 p.c. of eggs and the part of fertilized eggs in the total number of eggs from which the caterpillars did not hatch (22.46 p.c.) is but 3.62 p.c.

The analysis of the eggs of Angoumois grain moth points out that the number of fertilized eggs was about 80 p.c. The mortality of eggs is closely connected with climatic factors. The high temperature of 30°C and a low relative humidity of 45 p.c., influenced the great number of dead eggs of 44.87 p.c. When relative humidity rose to 60 p.c. under the identical temperature conditions, the number of dead fertilized eggs amounted to 24.72. At the maximum humidity of 80 p.c. the mortality of fertilized eggs is at least 12.69 p.c. The variable temperature of 23—27°C and relative humidity of 60—75 p.c. influenced the reduced mortality of fertilized eggs of 4.46 p.c. only.

The post-embryonal development of the engoumois grain moth is in strict dependence on the quantity and quality of food which is at caterpillars' disposal. The development of caterpillars lasts longer on corn plants than on wheat and the development of caterpillars lasts also longer on large-grained sorts than on grains of smaller size. With all the investigated plants, the development of males is shorter than that of females. The shortest period of larval and pupal development is on the small-grained wheat sort called Novosadska early 1., and amounts to 30.7 days on an average. The post-embryonal development of Angoumois grain moth lasted longer with corn sorts which have larger and heavier grain, which is the case with the late coarse-grained ZP. Sc. 704 (36.8 days) in comparison with the early corn sort ZP. Sc. (32.5 days). All wheat and corn sorts do not offer identical conditios for the development and survival of caterpillars and pupae of *S. cerealella*. The survival is the greatest with the corn sort ZP. Sc. 704 (63.80 p.c.), further on the wheat sort called PKB-coarse (60.60 p.c.). Characteristically little number of caterpillars that reached moth stage was observed on the wheat sort Novosadska early 1. (53.98 p.c.).

- Lecherq, J. and DeBast, D. (1965): Nutritional quality of oilseed protein isolates as determined with larvae of the yellow mealworm *Tenebrio molitor* L. — Jour. Nutr. 104: 1172—1177.
- Koura, A., El-Halfawy, M. A., Bishara, S. I. (1973): On the biology of *Tenebrio molitor* Lin in Egypt (Coleoptera: Tenebrionidae) — Bulletin de la Societe Entomologique d'Egypte, 56: 297—300.
- Mordue, W. (1965): Studies on oocyte production and associated histological changes in the neuro-endocrine system in *Tenebrio molitor* L. — J. Insect Physiol. 11: 493—503.
- Singh, P. (1975): Yellow mealworm, *Tenebrio molitor*, Life-cycle. — DSIR Information Series, 105/13, New Zealand.
- Tanasijević, N., Simova-Tošić, D. (1985): Posebna entomologija. — Poljoprivredni fakultet, Beograd.
- Tschinkel, W., Willson, C. and Bern, H. A. (1967): Sex pheromone of mealworm beetle (*Tenebrio molitor*). — J. Exp. Zool. 164: 81—86.
- Urs, K. C. D. and Hopkins, T. L. (1973): Effect of moisture on growth rate and development of two strains of *Tenebrio molitor* L. (Coleoptera: Tenebrionidae). J. Stored Product Res. 8: 291—297.

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A CONTRIBUTION TO THE STUDY OF THE INFLUENCE OF THE FEEDING OF IMAGOS AND OF CLIMATIC FACTORS ON THE DYNAMICS OF OVIPOSITION AND ON THE EMBRYONAL DEVELOPMENT OF YELLOW MEALWORM *TENEBRIO MOLITOR* L. (COLEOPTERA: TENEBRIONIDAE)

by

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Summary

In the present paper are set forth the results of the study of the influence of feeding on the length of life of imagos and on the dynamics of oviposition of *T. molitor*, as well as the influence of climatic factors on the embryonal development of this pest. The results have shown a direct influence of feeding on the duration of life of imagos and thereby also on the intensity of oviposition and on the total fertility, as well as on the global influence of temperature and relative humidity of air on the embryonal development of *T. molitor*.

The results of investigations have shown that *T. molitor* does not lay eggs up to the third day after the hatching. The first oviposition occurs in the period from the 3rd to the 6th day. The imagos reared on the wheat flour laid in this period but 0.24 p.c. in relation to the total number of laid eggs. The maximum number of laid eggs is in the period of female's age from the 12th to the 15th day (12.35 p.c. in relation to the total fertility). From this period to the end of female's life the intensity of oviposition diminishes and at the end of the female's life, i.e. after the 57th day the number of laid eggs is very small (0.14 p.c. in relation to the total number of laid eggs).

The females reared on the finely ground pastes have a similar dynamics of oviposition like the imagos reared on wheat, only the duration of their life is shorter (up to 42 days at the most). The maximum oviposition occurs in the period from the 18th to the 21st day of the female's age (16.25 p.c. in relation to the total fertility).

The females reared on the soybean flour laid the eggs more intensively in the beginning than those reared on wheat and finely ground pastes. And the maximum period of oviposition is from the 9th to the 12th day (16.38 p.c. in relation to the total number of laid eggs). At the end of their life, in the period from the 42nd to the 45th day they laid but 0.11 p.c. in comparison with the total fertility.

The results of investigations have shown that the intensity of oviposition of *T. molitor* depends on the feeding of imagos. In the beginning of oviposition, from the 3rd to the 6th day on the soybean flour, there were laid 1.64 eggs a day; on the finely ground pastes 0.15 eggs and on the wheat flour 0.33 eggs a day.

The period of maximum oviposition is the earliest with the females reared on soybean flour (from the 9th to the 12th day), when the average number of laid eggs amounted to 18.9 a day. Further, on the wheat flour (from the 12th to the 15th day with 17 eggs a day). On finely ground pastes from the 18th to the 21th day, when the females laid 17.5 eggs a day.

The total fertility depends, among other things, also on the length of imago's life. The females that lived longer had also a greater fertility. The females reared on wheat flour had the longest life (58 days) and they laid 414 eggs on an average; on the soybean flour, the length of females' life amounted to 46 days and the total fertility was 346 eggs. The shortest life was that of the females living on finely ground pastes (up to 40 days) and they laid 324 eggs on an average.

The length of embryonal development and the percentage of hatched larvae are in a close dependence on the temperature and relative humidity and vary in great proportions. At a temperature of 20°C the embryonal development lasts 12.60 days on an average and at the 25°C 7.55 days only. The data have shown that the eggs reared at the temperature of 30°C developed in 4.40 days at the relative humidity of 45 p.c. and the number of hatched larvae amounted to 33.62 p.c. At the relative humidity of 80 p.c. the embryonal development lasted 4.90 days and the number of hatched larvae amounted to 69.85 p.c. At a variable temperature of 23—27°C and at the relative humidity of 60—75 p.c., the embryonal development lasted 6.20 days and the number of hatched larvae amounted to 80.39 p.c.

- Caudwell, A. et Larrue, J. (1987): Shema de l'evolution de la *Flavescence dorée* chez la vigne et du development della cicadelle vectrice: les periodes critiques; Progrès Agricole et Viticole, 104 (9), pp. 218—217.
- Caudwell, A., Schvester, D., Moutous, G. (1972): Variété des dégâts des cicadelles nuisibles à la vigne; Le metodes de lutte; Le Progrès Agricole et Viticole, 89 (24), pp. 583-590.
- id., (1973): Variété de dégâts des cicadelles nuisibles à la vigne (suite); Le Progrès Agricole et Viticole, 90 (1), pp. 8—16.
- Caudwell, A., Larrue, J. (1979): Examen du probleme dela *Flavescence dorée* dans la carde de la sélection sanitaire de bois et plants de vigne; Le Progrès Agricole et Viticole; 96 (6), pp. 128-134.
- Egger, E., Borgo, M. (1983): Diffusione di una malattia virus —simile su »Chardonnay« ed altre cultivar nel Veneto. L'Informatore Agraria, 16, 25547-25556.
- Granata, G. (1982): Deperimenti e giallume in piante di vite, Informatore fitopatologico 7—8, pp. 18—20.
- Hevin, M., Moutous, G., Fos, Al., Rives, M. (1976): La transmission de la *Flavescence dorée* por la greffe en vert est facile et suggere que set maladie est distincte du corky barck; Proceeding 6th mitinh ICVG, Madrid 1976.
- Moutous, G. (1979): Le cicadelles de la vigne; metodes de lutte Le Progrès Agricole et Viticole; 96: pp. 232-235.
- Osler, R., Fortusini, A., Belli, G. (1975): Presenza di *Scaphoideus littoralis* in vigneti dell'Oltrepo pavese affetti da una malattia del tipo »*Flavescence dorée*«) della vite; L'Italia Agricola 101, pp. 1031—1049.
- Schevster, D. (1965): Phloem feeding vectors (with special reference to *Scaphoideus littoralis* Ball vector of the *Flavescence dorée*; Proceeding. ICVG, Davis 1965.
- Seljak, G. (1985): Cikada *Scaphoideus titanus* Ball (= *Sc. littoralis* Ball) u primorskem vinogradarskom rajonu zapadne Slovenije: Glasnik zaštite bilja VIII (2), pp. 33—37.
- Vidano, C. (1964): Scoperta in Italia dello *Scaphoideus littoralis* Ball, cicalina americana collegata alla »*Flavescence dorée*«) della vite; L'Italia Agricola, 101, p.p. 1031—1049.
- Vidano, C. (1966): Scoperta della ecologia ampelofila del Cicadellidae *Scaphoideus littoralis* Ball nella regione nearctica originaria; Ann. della Facoltà di scienze agrarie della Università degli studi di Torino, Vol VIII.

(Primljeno 20. 07. 1987)

SCAPHOIDEUS TITANUS Ball (= *Sc. littoralis* Ball), NEUER SCHADLING DER WEINREBE IN JUGOSLAWIEN

by

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Zusammenfassung

In Südwest-Slowenien (Jugoslawien) wurden bisher auf der Weinrebe folgende schädliche Zikadn gefunden: *Phyllaenus spumarius* L. und *Cercopis sanguinea* Geoffr. (*Cercopidae*); *Empoasca flavescens* F. (*Typhlocybidae*); *Stictocephala bisonia* Kopp. et Yonke (*Membracidae*); *Scaphoideus titanus* Ball (*Jassidae*).

Die letztgenannte aus Nord-America stammende Art ist neu für Jugoslawien und wurde im Jahre 1983 im Dorf Kozana — Goriška Brda (West-Slowenien) gefunden. Die Beobachtungen in den folgenden vier Jahren (1983—86) zeigten, dass *Scaphoideus titanus* Ball in Weinbergen Südwest-Sloweniens von Goriška Brda bis Nord-Istrien weit verbreitet ist. Die Populationsdichte der Art ist im allgemeinen gering. In zwei Orten wurde im Jahre 1985 Gradation ermittelt.

Der Lebenszyklus dieses Insekts entspricht in den Klimabedingungen Südwest-Sloweniens völlig anderen Regionen Südwest-Europas.

Scaphoideus titanus Ball ist monophage Art und kommt fast ausschliesslich auf *Vitis*—, selten auch *Parthenococcus*-Arten vor. Es wurde keine Sortenpräferenz ermittelt. Durch Saugen werden keine bemerkenswerten unmittelbaren Schaden verursacht. Die Art ist aber als Vektor der gefährlichen Krankheit — der Wergilbung der Weinrebe (*Flavescence dorée*) — bekannt. Die Bekämpfung ist nur dann notwendig, wenn diese Krankheit in Weinbergen verbreitet ist.

In der Arbeit werden noch die Beschreibung der Zikade und Richtlinien für ihre Bekämpfung gegeben.

INFLUENCE OF SOME FUNGICIDES ON MYCELIAL GROWTH AND
SCLEROTIA FORMATION OF *SCLEROTINIA SCLEROTIORUM* (LIB.)
DE BARY IN VITRO

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S u m m a r y

The investigated isolate of *Sclerotinia sclerotiorum* originates from the herb *Silybium marianum* Gaertn. The mycelial growth of the pathogen was tested by three protective fungicides iprodion, mancozeb vinchlozoline, fur systemic fungicides benomyl, bitertanol, thiophanate-methyl, thiabendazol and the fungicide combination of benomyl and vinchlozoline. The multiplying isolate that was cultivated on PDA media proved that the fungicide combination of benomyl and vinchlozoline with 200 ppb effects the survival of the fungus. This combination is the most effective. The significant reduction is also shown with the systemic fungicides benomyl and thiabendazol at 500 ppb, and thiophanate-methyl at 700 ppb, with protective fungicides iprodion and vinchlozoline at 1,5 ppm and mancozeb at 2,5 ppm. To reduce mycelial growth bitertanol must reach the concentration of 500 ppm. The same concentrations inhibit the sclerotia formation. Til now the effect of thiabendazol on *S. sclerotiorum* was not investigated.

- Dickey, R.S. (1979): *Erwinia chrysanthemi*: a comparative study of phenotypic properties of strains from several hosts and other *Erwinia* species. *Phytopathology*, 69, 324—329.
- Dickey, R. S. (1981): *Erwinia chrysanthemi*: Reaction of eight plant species to strains from several hosts and to strains of other *Erwinia* species. *Phytopathology*, 71, 23—29.
- Klement, Z. (1970): *Bacteriology. Jn: Methods in Plant Pathology* (Király, Z., Klement, Z., Solomosi, F., Vörös, J.). Akadémiai Kiado, Budapest.
- Panić, M. (1964): Prilog proučavanju bakterioze krompira u našoj zemlji — *Pectobacterium carotovorum* (Jones) Waldee. Magistarska teza. Poljoprivredni fakultet, Zemun.
- Panić, M., Ilić, B. (1976): *Pectobacterium carotovorum* (Jones) Waldee kao prouzročivač vršne truleži kukuruza. Poljoprivredna znanstvena smotra, 39(49), 197—204, Zagreb.
- Penčić, V., Panić, M., Jovanović, M., Lević J. (1986): Bakteriorna trulež stabla kukuruza. *Glasnik zaštite bilja*, br. 10—11, 366, Zagreb.
- Sutić, D., Panić, M. (1969): Metodi proučavanja fitopatogenih bakterija. Zavod za zaštitu bilja Poljoprivrednog fakulteta i Sekretarijat za poljoprivredu, šumarstvo i vodoprivredu SR Srbije, Beograd.
- Thompson, S.V., Hildebrand, D.C., Schroth, M.N. (1981): Identification and nutritional differentiation of the *Erwinia* sugar beet pathogen from members of *Erwinia carotovora* and *Erwinia chrysanthemi*. *Phytopathology*, Vol. 71, № 10, 1037—1042.

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**ERWINIA CAROTOVORA SUBSP. CAROTOVORA (Jones 1901),
BERGEY, HARRISON, BREED, HAMMER AND HUNTOON 1923 AS A
PARASITE OF THE CACTUS (*ALOE ARBORESCENS* Mill.)**

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S u m m a r y

From the diseased tissue, the disease being manifested in the form of the wet rot of the cactus leaves, have been taken several isolates of bacteria, of which in the present paper have been studied three.

Two-three isolates manifest common characteristics as regards the pathogeny and biochemical characteristics.

In addition to the cactus, from which they originate, they produce typical changes of the wet rot type also on kitchen-garden plants (slices of potato and carrot, onion bulbs, heads of cauliflower and cabbage) and on sunflower.

Bacteria are asporogenous, gram-negative and with paritrichal distribution of cilia. On the tobacco leaf they cause a hypersensible reaction in the course of 24 hours after the inoculation, and on the King's base do not create the fluorescent pigment.

They produce the acid without gas from galactose, glucose, xylose, manose, manite, saccharose, lactose, raffinose, and glycerin, and do not create it from arabinose, starch and dulcite. On maltose and dextrin develop the colonies of bacteria, but the colour of the indicator does not change, whereas the reaction on the base with esculine is not clear.

In the milk with the litmus there develops only coagulation without peptonization, Bacteria dissolve gelatin, create NH_3 and H_2S , do not hydrolyze starch, reduce nitrates and do not produce indole.

Their pathogenic, morphologic, rearing and biochemical characteristics show that they belong to the bacteria *E. c. subsp. carotovora*.

- Snyder, W.C. and Hansen, H.N. (1940): The species concept in *Fusarium*. *American J. of Botany*. v. 27, 64—67.
- YU, T.F. and Fang (1948): *Fusarium, diseases of broad bean III. Root rot and wilt of broad bean caused by two new forms of Fusarium*. *Phytopathology* 38, 578—594.
- YU, T.F. (1944): *Fusarium diseases of broad bean. I. A wilt of broad bean caused by Fusarium avenaceum var. fabae n. var.* *Phytopathology*, 34, 385—393.

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FUSARIUM OXYSPORUM F. SP. FABAE AS CAUSE OF ROT ROOT ON BROAD — BEAN IN YUGOSLAVIA

by

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Summary

On the best of the results obtained it may be concluded that the fungus isolated from the diseased stalk of broad-beans belongs to the *Fusarium oxysporum* Schl. f. sp. *fabae* Yu et Fang species.

On artificially infected plants the symptoms obtained are very similar to natural symptoms. Symptoms in field conditions are root necrosis spreading on ground stalk. Necrotic tissue becomes dark.

The fungus forms rank colony with pink-colored aerial mycellia. Mycellia coloros media pink. Micro and macro conidia of dimensions $7,2 \times 3,3 \mu$ and $3,2 \times 4,1 \mu$ respectively are formed on mycellia. Hlamidospores are $7,2 \times 6,8 \mu$.

The investigated fungus isolate was pathogenic to: broad-bean, soybean-Corsoy, bean-Biser, livestok peas Helios and Truženik. *F. oxysporum* f. sp. *fabae* grows best on soybean meal agar and worst on beans and corn meals. Optimal temperature for growth was found to be 25°C.

— jače zaraze zasada breskve utvrđene su u Vojvodini, Makedoniji i okolini Beograda,

— obzirom na opasnost daljeg širenja virusa šarke na breskvi potrebno je preduzeti odgovarajuće karantinske mere.

LITERATURA

- Clark, M. F., Adams, A. N. (1977): Characteristics of the microplate method of enzyme-linked immunosorbent assay for the detection of plant viruses. *Journal of General Virology* 34: 475-483.
- Dulić, I. i Šarić, A. (1986): Outbreak of plum pox virus on peaches in Yugoslavia. *Acta Horticulturae* 193: 161—165.
- Jordović, M. (1985): Prilog proučavanju šarke šljive i breskve. *Zaštita bilja* 172: 155—159.
- Newth, M. (1962): A gyünölesfa virusbetegsegekröl. *Kerteszeti es Szöleszeti* 11. Nr. 23: 17—19.
- Nemeth, M. (1963): Field and greenhouse experiments with Plum pox virus. *Phytopathologia Mediterranea*, Vol. II: 162—166.
- Ranković, M. i Šutić, D. (1980): Investigation of peach as a host of Sharka virus. *Acta Phytopathologica. Academia Scienhasum Hungaricae* 15 (1—4): 201—205.
- Ranković, M., Šutić, D. (1986): Resistance of some peach cultivars and variable pathogenicity of Sharka (plum pox) virus. *Acta Horticulturae* 193: 193—199.
- Šutić, D. i Ranković, M. (1981): Šarka šljive i sprečavanje njenog daljeg širenja u Jugoslaviji. *Jugoslovensko voćarstvo*, 55—56: 469—476.
- Šutić, D. i Ranković, M. (1983): Osetljivost nekih vrsta koštičavih voćaka prema šarki. *Zaštita bilja* 164: 241—248.

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INVESTIGATION OF THE PRESENCE AND DISTRIBUTION OF SHARKA VIRUS ON PEACHES IN YUGOSLAVIA

by

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Although Sharka virus has been widespread on plums and apricots in Yugoslavia, peaches have long been unaffected by this serious disease. It was discovered on peaches in our country as late as in 1984 in the area of Subotica — Horgoš sands (Dulić and Šarić, 1985).

Further investigations included the detection of Sharka virus presence in peach orchards in Vojvodina, Serbia proper and Macedonia. Repeated visual assessments of leaves and fruits for the presence of characteristic symptoms and the use of ELISA technique proved the presence of Sharka in peach plantings of Fruška Gora Mount, in Bela Crkva, in the vicinity of Belgrade and in Macedonia. Although numerous visual inspections and tests were conducted in the region of central Serbia (the areas

of Čačak, Prokuplje, Niš, Leskovac) there could be detected none peach trees infected with Sharka virus.

The investigations indicate the presence of a new Sharka virus strain in Yugoslavia which infects peaches, as well as the danger of its further spread. This is primarily due to the insufficient check when introducing varietie and nursery stock from the neighbouring countries in which Sharka has been known as a problem on peaches for a number of years, and because of the trade of planting material produced in Sharka-affected regions.

HERBICIDE APPLICATION DEPENDING ON INTENSITY OF WEED OCCURRENCE IN WHEAT

by

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S u m m a r y

Nowadays, there is a choice of herbicides to be applied to wheat. They will, however, provoke a certain depression. The intensity of weed occurrence well as potential depression caused by them must be significantly higher than herbicide depression in order to justify herbicide application. In weed-free wheat plots, any yield depression is automatically attributable to herbicide application.

At the experimental locality, the intensity of weed occurrence was very low. The dominant weeds were *Polygonum convolvulus*, *Sinapis arvensis* and *Chenopodium album*. All examined herbicides were highly efficient. The application of herbicides brought yield depressions even when performed at the optimum time, i.e., at the stage of tillering. The later application, close to the stage of shooting, intensified the depression. Our results are a further proof that herbicides should not be applied indiscriminately.

LITERATURA

- Blaeser, M. (1980): Auswirkungen von Spargelentkrautung auf den Ertrag im Folgejahr. Zeitschrift für Jagdwissenschaft 26, 1, 41—44.
- Diekmann, M. (1983): Einfluss von Wildverbiss auf der Ertrag verschiedener landwirtschaftlicher Kulturpflanzen — Ergebnisse von Verbiss — Simulationssversuchen. Ibidem 29, 2, 95—110.
- Hooker, A. L. (1979): Estimating disease losses based on the amount of healthy leaf tissue during the plant reproductive period. Genetika (Beograd) 11, 2, 181—192.
- Maček, J. (1983): Procena intenziteta napada i gubitka prinosa od biljnih bolesti. Priručnik izveštajne i prognozne službe zaštite poljoprivrednih kultura. Savez društava za zaštitu bilja Beograd. Beograd 1983, 65, 99—198.
- Maček, J., T. Zupančič (1987): Zmanjševanje listne ploskve kot simulacijska metoda za ugotavljanje vpliva rastlinskih boleznj in poškodb na pridelek pri semenskem krompirju (*Solanum tuberosum* L.). Zaštita bilja, Vol. 37 (4), br. 178, str. 349—354.
- Maček, J., M. Grča-Celec (1987): Zmanjševanje listne ploskve kot simulacijska metoda za ugotavljanje vpliva rastlinskih boleznj in poškodb na pridelet paradižnika (*Solanum lycopersicum* L.). Zaštita bilja, Vol. 37 (4), br. 178, str. 343—347.
- Novak, J. (1958): Uticaj smanjenja lisne površine na prinos grožda i sadržaj šećera i kiseline u širi kod vinove loze. Arhiv poljopr. nauka 10 (1958) str. 81—92.
- Novak, J. (1959): Der Einfluss einer verringerten Blattfläche auf Traubenertrag, sowie Zucker — und Säuregehalt des Weinmostes. Die Weinwissenschaft. Beilage zur Fachzeitschrift Der Deutsche Weinbau 14, 9, 1—10.
- Panjan, M., Lušin, V., Prpić, Z. (1954): Brzina izrodivanja krompira od čupane i nečupane cime. Zaštita bilja 24, 41—48.
- Schöffling, H. (1965): Der Einfluss verschiedener Kulturmassnahmen auf die quantitativen und qualitativen Ertragseigenschaften der Kulturrebe. Inaug. Diss. Friedrich Wilhelms-Universität Bonn, 64—68.

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EINFLUSS KÜNSTLICH VERRINGERTER BLATTFLÄCHE IN
VERSCHIEDENEN PHENOPHASEN AUF DEN ERTRAG BEI DREI
BUSCHBOHNENSORTEN (*PHASEOLUS VULGARIS* L. VAR.
NANUS ASCHERS.)

von

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Zusammenfassung

Es wurde eine Simulationsmethode für die Ermittlung des Einflusses der Verringerung der Hälfte der Blattfläche in verschiedenen Phenophasen auf den Ertrag bei Buschbohnen angewandt. Es wurden Sorten 'Berggold', 'ribenčan' und 'starozagorski' untersucht. Es ist sehr bedeutend, dass die bei beschädigten Pflanzen gewonnenen Erträge nicht annähernd um die Hälfte verringert wurden, und also diese Pflanzen den Verlust der

Blattfläche ausgleichen können. Einfluss der Termine der Blattflächene-ntnahme war statistisch signifikant bei $p = 0,05$. Um die Ermittlung dieses Einflusses wurden lineare, quadratische, kubische und quartäre Kombinationen errechnet. Es wurde festgestellt, dass nur Gerade statistisch signifikant ist.

Es wurden Regressionsgleichungen für das Verhältnis zwischen der entnommenen Blattfläche (x) und dem Ertrag (y) errechnet, sowie Korrelations — und Determinationskoeffizienten. Die Regressionsgleichungen lauten für 'Berggold' $y = 2,65 + 0,0134 x$, für 'ribenčan' $y = 6,55 + 0,0116$ und für 'starozagorski' $y = 3,96 + 0,0110 x$.