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A CONTRIBUTION TO THE STUDY OF *DITYLENCHUS DIPSACI*
(KÜHN) FILIPJEV, 1936 WITH REGARD TO WHEAT, MAIZE,
SUGAR BEET AND TOBACCO AS HOST PLANTS

by

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S u m m a r y

The stem nematode *Ditylenchus dipsaci* (Kühn) Filipjev has been observed so far in Serbia on 19 species of cultivated plants (13 agricultural and 6 ornamental ones): wheat, barley, oats, maize, lucerne, sugar beet, oilseed rape, sunflower, onion and garlic, carrot, potato; further carnation, gladiolus, hydrangea, hyacinth, narcissus and tulips.

During passed three years' period (1984—1986) marked damages were observed on wheat, maize, sugar beet and tobacco.

The results of initial investigations of biological races indicate the assumption of similarity or even identity of the »sugar beet« and »maize« races of stem nematode.

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(Primljeno 10. 12. 1987.)

APPEARANCE AND IDENTIFICATION OF THE MOST IMPORTANT HARMFUL INSECTS ON SOYBEAN IN THE S. R. OF SERBIA

by

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S u m m a r y

In the course of 1985/86 we established, in many localities of the S. R. of Serbia, on the soybean the presence of 23 insect species, two of which feed on the stalk, two on the pod; one on the flower, 15 on the leaves, while 3 were predatory ones.

We consider as particularly important the discovery of *Etiella zinckenella* Tr., the larvae of which damage two soybean pod and seeds. It was observed in several localities of Serbia. The occurrence of large number of predatory cecidomyidae *Acarolestes tetranychorum* indicates that a particular care ought to be taken in controlling the maggots which are sometimes very numerous on soybean, in order to protect this useful species.

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(Primljeno 20. 09. 1987.)

THE EFFECT OF TEMPERATURE ON THE DURATION OF EMBRYO DEVELOPMENT OF SUMMER FRUIT TORTRICID *ADOXOPHYES ORANA* F. v. R. (LEPIDOPTERA, TORTRICIDAE)

by

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S u m m a r y

The duration of embryo development of *Adoxophyes orana* F. v. R. was assessed under field conditions in some localities of SR Serbia over the 1975—1985 period. Laboratory studies were also carried out to determine the effect of various constant temperatures on the duration of embryo development and the mortality of *A. orana* embryos at 75—85% relative humidity and a photoperiod of LD 16 : 8.

Temperature as ecological factor greatly affects the duration of embryo development and the mortality of *A. orana* embryos.

In the climatic conditions of SR Serbia, the embryo development of the 1st generation of *A. orana* ranges from 7,3—14,7 days.

The average duration of embryo development in the 1st generation amounts to 9.2 and in the 2nd generation 11.1 days.

In the Čačak area the embryo development in the 1975—1985 period, during the entire oviposition period, lasted 8.7—11.0 days, with an average of 9.6 days.

At constant temperatures the embryo development shortens proportionately to temperature increase. The embryo development at 15°C lasted 16.7 days and at 28°C — 5,3 days.

The optimum temperature for embryo development is 21°C, whereas temperature deviation from the optimum enhances the mortality of embryos at 15°C amounts to 35.4%, at 18°C — 22.5%, at 21°C — 17,5% and at 28°C — 56.4%.

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(Priljeno 30. 09. 1987.)

INFLUENCE OF FOOD AND CLIMATIC FACTORS ON THE POST-
-EMBRYONAL DEVELOPMENT OF THE YELLOW MEALWORM
TENEBRIO MOLITOR L. (COLEOPTERA: TENEBRIONIDAE)

by

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Summary

There was studied the influence of the food on the growth, resp. weight and duration of development of larvae of *T. molitor* as well as of the temperature and relative humidity on the development of the

pupae of this pest. The results have shown that the food has a considerable influence on the growth of larvae of the Yellow Mealworm, for the intensive growth of larvae within the 4 weeks' period differed to a considerable extent in dependence on the food they were fed with. In this period the larvae reared on the corn flour were heavier by 25 mg on an average. Further those reared on wheat (22 mg) and on cookies (21 mg). The weight of larvae which were fed on the lentil increased by 15 mg only.

Food and temperature act together on the duration of development of the larvae of *T. molitor*. Under the same temperature conditions the development of larvae on the lentil, corn and wheat lasts longer than on the soybean, cookies and finely ground pastes. At the temperature of 20°C, larvae of the Yellow Mealworm had the longest duration of development on lentils (204.2 days on an average) and on corn (193 days). The shortest larval development is on soybean (114.8 days on an average) and cookies (139.6 days). At the temperature of 30°C, the development of larvae on the soybean flour lasted 72.7 days on an average. Larvae had a comparatively fast development also on the cookies (91.7 days on an average) and on finely ground pastes.

The duration of development of Yellow Mealworm pupae is conditioned by the temperature and relative humidity and it varies on a large scale. The development of female pupae is somewhat longer than that of the male ones. At the temperature of 20°C and relative humidity of 55 p. c., the average development of pupae lasts 14.9 days. Pupae reared at the temperature of 25°C and relative humidity of 55 p. c., completed their development in 8.7 days on an average. At the temperature of 30°C, the duration of pupal development varied from 6.3 days at the relative humidity of 45 p. c. to 6.9 days at the relative humidity of 80 p. c. At the variable temperature of 23°—27°C and relative humidity of 60—75 p. c., the duration of pupal development is 9.2 days on an average.

The results of the study of the development of pupae have shown that the death rate of *T. molitor* at the stage of pupa was not great. Except under the conditions of a low relative humidity of 45 p. c. at the temperature of 30°C, when the number of emerged imago amounted to 79.38 p. c. At the variable temperature of 23°—27°C and relative humidity of 60—75 p. c., the number of pupae which concluded their development, resp. from which the imago have emerged, amounted to 98.07 p. c.

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INFLUENCE OF FOOD AND TEMPERATURE ON POST-EMBRYONAL SURVIVAL OF YELLOW MEALWORM *TENEBRIO MOLITOR* L. *COLEOPTERA: TENEBRIONIDAE*)

by

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Summary

There was studied the influence exerted by temperature and food on the post-embryonal survival of the yellow mealworm. The results have shown that the death rate of *T. molitor* is greater at the stage of larva than

at that of pupa. Ground wheat and corn, as well as the moderate temperature of 25°C and variable temperature of 23—27°C have a more favourable influence on the survival of the yellow mealworm in contrast to the finely ground pastes, soybean and high temperatures of 35°C which conditioned the high death rate of the larvae and pupae of this pest.

The survival of *T. molitor* at the larval stage is the greatest on wheat (86.50%) and corn (83.50%). Further on the lentil (78.00%) and cookies (74.50%). The exceptionally little number of larvae which concluded the development is on finely ground pastes (59.00%) and soybean (62.00). The survival, of the yellow mealworm at the pupal stage varies from 95.96% on the soybean to 98.72% on the lentil, in relation to the total number of formed pupae. Taking into account also the hatching of imagos, total survival of *T. molitor* is the greatest with the part of population which developed on the wheat (85.00%) and corn (81.00%), whereas the soybean and the finely ground pastes influenced the considerably lower percentage of survived insects (59.50% resp. 58.00%).

By adding water or carrots to the soybean and finely ground pastes, the survival of the larvae of the yellow mealworm was considerably increased. There was, however, no great difference in the number of pupae from which have hatched the imagos.

In addition to food, temperature exerts also a considerable influence on the possibility of survival of *T. molitor*. When the larvae were reared on wheat, the greatest number of larvae having concluded the development were at the temperature of 25°C (88%) and 30°C (82.50%). At the comparatively low temperature of 20°C resp. high temperature of 35°C, the survival of larvae is lower (74.00% resp. 70.50%).

The death rate of *T. molitor* occurs at all the development stages, but it is higher at the larval stage in relation to the stage of pupa. The mortality of larvae is distinctly high at the temperatures of 35°C (29.50%) and 20°C (26.00%), whereas the mortality of pupae is also very high at the temperatures of 35°C (9.00%), resp. 30°C (7.00%).

The food on which the larvae are reared has also an expressed influence on the mortality of the yellow mealworm, particularly on finely ground pastes (41.00%) and on soybean (38.00%) of dead larvae. A very small number of dead larvae is on wheat (13.50%) and on corn (16.50%).

bovala larva, te su kod nje i organi za varenje jako razvijeni. Imago može u prisustvu tečnosti da je usvaja i kod njega ingluvius, shodno količini uzete tečnosti, je manje ili više razvijen. Pored ovoga, kod larava uočavamo dobro razvijene labialne žlezde, a što je isto vezano za ponašanje larava koje se sreću na površini proizvoda, gde hranu opletu ogromnom količinom paučine.

Polni organi mužjaka i ženke su tipični za ovu grupu *Lepidoptera* i ne čine nikakav anatomski izuzetak. U radu smo opisali izgled ovariola koje su meroističko-politrofičkog tipa, koji je poznat kod većine *Lepidoptera*, *Dytrisia*. Takođe smo opisali i proces ovogeneze, kao i izgled parnih i neparnih jajovoda, dodatnih žlezda i neparnog jajovoda.

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REPRODUCTIVE AND ALIMENTARY ORGANS OF LARVAE AND ADULTS OF THE INDIAN — MEAL MOTH (*PLODIA INTERPUNCTELLA* Hbn. LEPIDOPTERA, PHYCITIDAE)

by

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Summary

Contribution to the knowledge of anatomy of the Indian — meal moth, *Plodia interpunctella* Hbn. was made in this paper.

Alimentary canal differs in length with larvae and imago. The midgut is rather poorly developed with imago, while it is very long with

larvae. This is closely associated with the way of this species life. Imago is able to accept the moisture which is accumulated in ingluvius. Larvae have well developed labial glands which produce an enormous quantity of webs on the surface of the products.

Male and female reproductive system is typical one for this group of *Lepidoptera* and they are not of any anatomic exception. The aspect of meroistic — polytrophic type of ovariole, that is well known with the majorit of *Lepidoptera*, *Dytrisia* is described. We have also described the process of ovogenesis as well, and the aspect of lateral, medium oviduct and accessory glands.

SOYBEAN SUSCEPTIBILITY TO *DIAPORTHE PHASEOLORUM* VAR. *CAULIVORA* AT DIFFERENT PHENOSTAGES OF DEVELOPMENT

by

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Summary

The susceptibility of soybean to *D. phaseolorum* var. *caulivora* at different phenostages of development was examined by inoculation, i. e. spraying of plants by ascospore suspension. Soybean was susceptible to this pathogen from germination to the beginning of plant maturity and it showed higher susceptibility after plants reached the generative stage of development. According to our results, the highest percentage of infected plants and the most conspicuous symptoms of disease were observed when the inoculation was done from the time of full flowering (R_2) to the time of grain filling (R_5). First symptoms never occurred before the beginning of pod setting, disregarding the time of inoculation.

The length of incubation period significantly varied in dependence of variety of plant and phenostage in which the inoculation were done. If we observe variety as a factor, we may conclude that the length of incubation period was quite proportional to the length of vegetation of examined varieties. In early varieties, the shorter period was necessary, while in late varieties there was longer period of incubation. The incubation period significantly dependence on phenostage of soybean in which the inoculation was performed. The longest incubation period was observed when the young plants was inoculated, and it was becoming shorter and shorter with prolonging the moment of inoculation.

In the conditions of inoculation by the method of toothpicks, soybean showed a high degree of susceptibility to *D. phaseolorum* var. *caulivora* at all phenostages of development. Lower susceptibility was observed only at the phenostage of first true leaf (V_2) and at the beginning of yellowing of leaf (R_7).

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CHARACTERISTICS OF SOME BACTERIAL STRAINS ORIGINATING FROM SOYBEAN

by

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Summary

From the leaf and seeds of soybean there have been isolated several bacterial isolates with white colour of colonies, five of which were investigated more in detail, to wit: S-2, S-27, S-28, S-33 and S-35,

It was observed that they had many common properties, but also some different characteristics. All of the five isolates cause necrotic changes on the tobacco leaf, but only 2—3 days after the inoculation.

Beside on soybean, they manifest their pathogenic character also on inoculated plants of bean and paprika and on the lemon fruits. Three of the five investigated ones (S-27, S-33 and S-35) create the fluorescent pigment on the King's B medium, and two of them (S-3 and S-28) have not this property. As regards the decomposition of carbon compounds, they show, in addition to similarities, also some differences.

Bacteria are rod-shaped, asporogenous and gram-negative. On the mesopeptin medium they form two types of round whitish, tiny or gently undulated edges and bulging or flat profiles.

They do not create acids from the maltose, dextrin, starch, esculin and dulcitol; do not produce H_2S , nitrites and indole nor hydrolyze the starch; they create NH_3 , decompose the gelatine (except S-2) and effect peptinization of milk (except S-2). MR and Vp tests are negative.

On the basis of the pathogenic, morphologic, rearing and biochemical characteristics there results that they show greatest similarities with the bacterium *Ps. s. pv. syringae* van Hall, to which they most probably belong.

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POWDERY MILDEWS ON CUCUMBERS IN CROATIA

by

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Summary

Up until now only causal agent of cucumber powdery mildew reported was *E. cichoracearum*. On the basis of our investigations of the shape of conidia, mode of germination, and the appearance of fibrozin bodies inside them, we have come to suspect that our isolate belongs to *Sphaerotheca fuliginea*. Our assumption was confirmed by the cleistothecia and infection of dandelion (*Taraxacum officinale*). In this way, Hirata's (1966) theory, that the shape and mode of germination can be used to distinguish *E. cichoracearum* from *S. fuliginea*, has been confirmed.

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PSEUDOMONAS SP., COUSAL AGENT STEM PITH NECROSIS AND WILT OF TOMATO

— Preliminary communication —

by

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S u m m a r y

Some *Pseudomonas* sp., isolates from naturally infected tomato stem caused hypersensitive reactions in the inoculated tobacco leaves and stem pith necrosis and wilt of the inoculated tomato plants.

Due to the some microbiological and pathological properties these isolates could belong to the species *Pseudomonas corrugata* whose presence is not known in Yugoslavia until now.