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Review paper

DIVERSITY OF STRAINS AND ISOLATES OF PLUM POX POTYVIRUS

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In this review, most important knowledge on behaviour and diversity of strains and isolates of plum pox potyvirus (PPV) is summarized on the basis of more than a hundred references of the international literature.

Bilogical differences between strains or isolates of PPV can become evident in different virulence and pathogenicity, respectively. Types and severity of symptoms caused by distinct strains as well as their ranges of host plant species can considerably differ. Biological behaviour of PPV strains sometimes, but not in every case, correlates with a distinct serotyping. Clear biological and serological differences were recorded between „normal" PPV strains and „cherry" strains regarding systemic and not systemic infections, respectively, of *Prunus cerasus* and other *Prunus* species, whereas D- and M-strains can be differentiated by systemic and not systemic infection of plum hybrid K4. Three PPV strains can be differentiated by types of local lesions caused in *Chenopodium foetidum*.

Serological diversity of PPV strains and isolates could be detected by using several specific monoclonal antibodies enabling a differentiation of various serotypes of PPV. Besides the major strains PPV-D and PPV-M, minor strains PPV-C and PPV-EA could be differentiated. Several other PPV strains were found serologically related to but not identical with strains of the mentioned groups and differing in specific biological or molecular characters.

Molecular biological techniques greatly facilitated the elucidation of the genes involved in disease determination as well as clear differentiation between distinct PPV strains. Isolates of PPV-D contain *Rsa* I and *Alu* I recognition sequence in the C-terminal part of the PPV gene, whereas those of PPV-M lack the *Rsa* I sequence and have only *Alu* I sequence. C- strains (PPV-SoC) contain neither *Rsa* I nor *Alu* I restriction sites. PPV-SoC differs from isolates of PPV-D, -M and -EA isolates at multiple amino acid positions. A significant difference between PPV-SoC and other PPV isolates is the amino acid valin at its N-terminus of the CP instead of alanin.

An overall correlation was found between the results obtained by DAS-ELISA using PPV-D and PPV-M serotype-specific MAbs and those obtained by specific RT-PCR assay, RFLP analysis of RT-PCR fragments or western blot evaluation of CP mobility. Distinguishing other PPV isolates failed, so it was taken in consideration that recombination may occur between D and M strains.

Several other PPV strains and isolates show rather high levels of nucleotide diversity in the sequence encoding the C-terminal region of the NIb protein and the N-terminus of CP. Among them, one strain seems to be the result of a natural recombination event between two wild PPV strains. A distinct alteration in amino acid residues close to the N-terminal end may be possibly responsible for the ability of aphid transmission of PPV-AT in contrast to PPV-NAT.

Evidence suggests that the two PPV serotypes D and M show significant differences in their epidemiological properties and their natural host range. PPV-M isolates seem to spread more epidemically in nature and to cause more severe infections in peach orchards than PPV-D isolates. PPV-M is readily transmitted by aphids to peach, plum and apricot, whereas PPV-D is little or not at all aphid transmissible to and between peaches. Aphid transmission of PPV-SoC from one *Prunus* species to another suggests a possible role for the vectors in the epidemiology of the disease among stone fruit trees in nature.

Key words: Plum pox potyvirus, strains and isolate, diversity, review.

PYTHIUM MAMULATUM MEURS., A PARASITE OF THE HOP

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S u m m a r y

Cultural and morphological characteristics and pathogenicity of the isolate H-120 of the fungus originating from necrotic tissues of the wilting hop variety Brewer's gold were investigated (Fig. 1-3). Isolation was succesfully done only on a differential medium (Cvjetković et. al.,1982). Fungus development was monitored in a corn meal medium (CMA) and potato dextrose medium (PDA). On CMA, the fungus developed circular colonies with a thin whitish mycelium in the surface part of the colony. On PDA, the surface part of the colony was whitish, better developed and thicker than on the former medium, forming an undulated edge.

In young cultures of the fungus, the hyphae were branched and aseptate. Septa were formed at the time of the formation of the reproductive organs of the fungus. The diametar of the hyphae varied between 3,5 and 7,8 μm. After two to three days of growing, the fungus developed hyphal swellings and reproductive organs on both media.

Zoosporangia were spherical, sometimes ovate, terminal or intercalary. The diameter of the zoosporangia varied from 13,8 to 20,5 μm. Mature zoosporangia formed elliptical vesicle attached to the zoosporangium by discharge tube. About 10 zoospores were formed per vesicle.

Oogonia were spherical, terminal or intercalary, with projections of different lengths (2,5- 6,5 μm) forming on their walls. The diameter of the oogonia without projections was between 13,5 and 21,0 μm, most frequently between 16,0 and 18,5 μm, 17,0 μm on average.

Antheridia were clavate, usually monoclinous but sometimes diclinous. Antheridia and oogonia copulated to produce oospores which were globular, 16,0 - 20,6 μm in diameter, most frequently between 18,0 and 20.0 μm, 18,5 μm on average. Oospores' wall thickness was 0,7 to 1,5 μm, most frequently 1,0 to 1,3 μm, 1,1 μm on average. As a rule, the oospores completely filled the oogonium (plerotic), although some oospores were aplerotic.

Artificially inoculated hop plants exhibited identical symptoms to those observed on naturally infected ones. Inoculated pepper plants developed leaf chlorosis, then they wilted and dried. The fungus investigated was regularly reisolated from artificially inoculated plants.

Based on the study of the cultural, morphological and pathogenic characteristics, we can conclude that the isolate investigated belong to the species *Pythium mamilatum*

RESPONSE OF SOYBEAN GENOTYPES TO *PHOMOPSIS LONGICOLLA*, THE CAUSAL AGENT OF SEED DECAY

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S u m m a r y

We studied the reaction of 15 domestic soybean varieties and lines to *P. longicolla*, the causal agent of seed decay, using two inoculation methods: seed inoculation on filter paper and spraying with conidial suspension of plants at the phenophase R6-R7, grown in a vegetation house. Reaction of the tested genotypes was also assessed under conditions of natural infection in field.

The genotypes differed significantly in the degree of sensitivity of soybean genotypes in the two inoculation methods. The differences were the most distinct in the lines NS-L-220159 and NS-L-201120. It appears that the sensitivity of seed just before the beginning of maturation is not directly associated with the sensitivity of mature seed, as indicated by the negative correlation between the sensitivity indicators in the two tests (R= -0,280). Although the correlation coefficient was not statistically significant, it nevertheless suggested the presence of certain regularity.

Not a single tested variety or line was fully resistant to the disease. Still, there existed significant differences in the degree of sensitivity. In the inoculation test on filter paper, the line NS-L-220159 exhibited a high degree of resistance of mature seeds. In conditions of spontaneous infection in field, the later genotypes were less sensitive than the medium and early ones. The line NS-L-220124 was found to be the least sensitive.

However, the inoculation with the conidial suspension, done in the most vulnerable phase of plant development (R6-R7), showed that the lower sensitivity of the late genotypes in the field was not genetically based, but was the consequence of the avoidance of the infection. In conditions of inoculation, the varieties Afrodita and Vojvodjanka and the new lines NS-L-201120, NS-L-210161 and NS-L-225151 exhibited a lower degree of sensitivity than the other tested genotypes.

Key words: soybean, *Phomopsis longicolla*, *Phomopsis* seed decay, response of genotipes.

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ANATOMY OF REPRODUCTIVE ORGANS *APHIDOLETES APHIDIMYZA* ROND. *(DIPT. CECIDOMYIIDAE)*

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Summary

Anatomic appearance of female reproductive organs of Diptera is much alike. Ovaries of *A. aphiimyza* are seperated, pear-like shaped or bunch-like, with no pigments, consisting of 15 ovarioles. The process of oogenesis and vitellogenesis have signifficantly developed in pupal stage, so each ovaliole included in newly eclosed individual contains one mature egg.

An ovariole is of meroistic, polytrophic type and covered by one ovariole membrane which ends in a terminal filament in a terminal part. The smallest part of the ovariole is called germanium where future oocytes, nurse cells-trophocytae and follicular cells are located. In completely mature egg, previously formed chorion, which is the product of follicular cells, can be observed as well as trophocytae with reduced cytoplasm and nucleus (pyknotic).

Male reproductive organs of *A. aphidimyza* have the typical appearance of the reproductive organs of Diptera. A pair of testes are clearly differentiated, large and globular, and connected with vasa deferentia continued by a very long ejaculatory duct (ductus ejaculatorius) into which accessory glands intake. Males are also full grown for insemination just after pupal stage.

Key words: *Aphidoletes aphidimyza*, predator, reproductive organs.

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COLLETOTRICHUM CAPSICI THE PATHOGEN OF PEPPER FRUIT

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Summary

During 1995 and 1996, the significant appearance of brown spot and anthracnose of pepper fruits was registered in some localities around Zrenjanin (Vojvodina). Cited symptoms were recorded at the end of summer and at the begining of autumn. The brown spots appeared not on pepper leaves and stalk, but only on fruits.

On synthetic acid agar (SAA), potato dextrose agar (PDA), malt extract agar (MA) and broath bean medium (BA), the fungus forms grey-white colonies.

On SAA the round to elliptical and flat to oval - shaped acervuli are formed. They are black and 269-359 x 136-173 μm in size. The setae are black, straight to slighty curved, 71.3-155 x 2.48-5.2 μm in size, formed only on SAA.

The conidia are sickle-like curved, 15.5-28.52 x 3.1-4.96 μm in size. The fungus grows on all media tested, but the conidium formation in acervuli was observed in abundance only on SAA and poorly on BA (Table 1.).

Key words: *Colletotrichum capsici*, pepper; fruits, brown spots, anthracnose, acervuli, setae, conidia.

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