

**RESEARCHES ON THE DEGREE OF ATTACK OF PATHOGEN
PODOSPHAERA LEUCOTRICHA
 (ELL.et EV) SALM IN THE CLIMATIC CONDITIONS OF YEAR
 2007 AT S.C.D.P. IASY**

**CERCETĂRI ASUPRA GRADULUI DE ATAC AL
 PATOGENULUI *PODOSPHAERA LEUCOTRICHA*
 (ELL.et EV.) SALM. ÎN CONDIȚIILE ANULUI 2007
 la S.C.D.P. IAȘI**

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Abstract: The paper presents the results of observations on the evolution of pathogen Podosphaera leucotricha (Ell.et Ev)Salm for the breeds Idared 1st year, Idared 2nd year, Golden spur 1st year, reflected in the statistic calculation of the degree of attack in the climatic conditions of year 2007 during the vegetation period.

Rezumat: Lucrarea prezintă rezultatele observațiilor privind evoluția patogenului Podosphaera leucotrichae (Ell.et Ev)Salm la soiurile Idared, Golden Spur reflectate prin calculul statistic al gradului de atac în condițiile climatice ale anului 2007. Observațiile s-au desfășurat pe tot parcursul anului 2007 în timpul perioadei de vegetatie

MATERIAL AND METHOD

We studied the degree of attack for apple tree mildew *Podosphaera leucotricha*(Ell.et Ev)Salm. For all breeds, we focused on three variants, each variant containing 5 repetitions and each repetition containing 10 apple trees.

Table 1

Degree of attack of pathogen Podosphaera leucotricha in the climatic conditions of year 2007 at SCDP Iasy

Var. Breeds\	V ₁	V ₂	V ₃	V
Idared an I	2,0010	0,3331	0,4672	2,8013
Golden spur an I.	1,7810	1,3104	2,4406	5,532
Idared an II	0,5015	1,2211	0,1318	1,8544
B	4,2835	2,8646	3,0396	X =10,1877

Podosphaera leucotricha (Ell. Et Ev.) Salm – apple tree mildew



Fig 1. *Podosphaera leucotricha* (Ell.et Ev) Salm

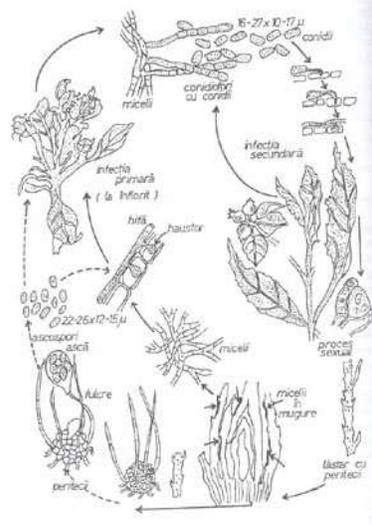


Fig. 2. Ciclul evolutiv la *Podosphaera leucotricha* (Ell.et Ev) Salm.

Mildew is one of the most important diseases that frequently attacks apple trees. In the favorable years, the disease produces important damages for the sensitive breeds registering 37 – 80% leaves attacked, 46-98% offshoots attacked, 6-20% from inflorescences and 8-25 % from the vegetative buds.



Photo 1. Attack of pathogen *Podosphaera leucotricha* (Ell.et Ev)Salm –Golden spur

Symptoms. Mildew appears from the beginning of budding and then on the vegetative buds from the offshoots attacked in the previous year. The mildew attack manifested on leaves. The trees strongly affected by mildew in the first part of the vegetation period lose their leaves at the end of May.



Photo.2. Attack of pathogen *Podosphaera leucotricha* (Ell.et Ev)
Salm –Offshoot attacked.

The organs attacked by mildew are covered by a white dirty powdery coat made from mycelium, conidiophores and the fungus conidia. The vegetative and floral buds attacked by mildew largely evolve up to the beginning of budding then they get covered by a white dirty powdery coat and finally they get red, dry off and fall.(Photo.1, Photo 2)



Photo 3 . Attack of pathogen *Podosphaera leucotricha*
(Ell.et Ev)Salm -Idared I.

A part of the floral buds attacked evolve up to the phase of inflorescence spreading afterwards they dry off; others reach the blooming phase when they get covered completely by mildew. These buds have deformed leaves, flowers with elongated greenish petals covered by mildew. The flowers attacked are sterile, dry off very quickly and fall. They registered very rare cases of mildew attack on apple tree fruits. The offshoots attacked are covered by a white dirty coat, they do not grow normally, the wood does not ripen and in most cases it dries off in summer or gets nipped during the interval December-March. When there is a large percentage of attacked offshoots (more than 20%), trees are on the wane, the production decreases for at least 2-3 years due to the fact that there are no branches for 2-3 years on which fruits might form.

Biology of the pathogen agent. The fungus *Podosphaera leucotricha* (Ell. et Ev) Salm., has a conidial shape *Oidium farinosum* Cke. This fungus producing mildew on apple trees belongs to the sub-phylum *Ascomycotina*, cl. *Ascomycetes*. Ord. *Erysiphales*, fam. *Erysiphaceae*. (fig.1, fig.2)

On the surface of the organs attacked develops the fungus mycelium, hyaline, septum-like, ramified from where appear spherical haustoria penetrating the epidermis cells. On the mycelium, on the surface of the organs attacked, appear simple, long conidiophores on which show up chains of unicellular ellipsoidal conidia cut off at their ends.

Their dimensions vary between 16-27 μm in length and 10-17 μm width. During the vegetation period, the pathogen agent breeds by conidia. The temperature of 18-22°C, accompanied by humidity of 90-100 % resulted from dew, fog or rain favors the fungus breeding, the germination of conidia and the penetration of haustoria in the cells of the host plant. The fungus feeds on the epidermis cells and the mesophyll cells.

During winter the fungus resists as a resistance mycelium between the buds scales on the offshoots; perithecia appear on offshoots or the leaves attacked; the conidia from the previous year remain at the branch insertion, on the surface of the offshoots and buds attacked.

Perithecia are generally spherical with 3-11 appendices with their tops dichotomically ramified but in certain cases they are simple. These are situated in the upper part of perithecia. Each perithecium has a single ascus with ellipsoidal unicellular ascospores. Ascospores are 22-24 μm long and 12-15 μm wide. The damages caused by this disease vary deepening on the breed sensitivity.



Photo 4. Attack of pathogen *Podosphaera leucotricha* (Ell.et Ev)Salm -Idared II.

RESULTS AND DISCUSSIONS

From the thermal viewpoint, the agricultural year 2006-2007 was a normal year having an annual average temperature of 12,7°C. In the vegetation period (IV-IX), the average temperature was 15,37°C. The lowest temperature was registered on February 10th namely – 20,4°C, and the maximum temperature of the year was registered on July 15th namely 40,0°C. From the precipitations viewpoint, this agricultural year was characterized as a “droughty” year since it registered a volume of precipitations of about 463,2 mm.

Table 2

Climatic conditions of year 2007 at SCDP lasy

Month	Temperature °C			Precip. mm.	Relative humidity
	12,4	- 2,7	32,5		
	6,8	-3,5	18,4	18,0	84
	2,8	-6,7	14,5	2,8	88
	4,5	-9,8	16,9	26,0	78
	1,3	-20,4	17,6	25,2	86
	8,1	-2,0	21,6	26,2	71
	11,0	0,8	24,7	29,6	59
	19,6	0,0	38,8	33,4	62
	23,1	12,5	36,5	22,0	60
	25,2	11,4	40,0	45,0	54
	22,5	11,3	37,1	112	75
	16,0	4,3	26,7	87,8	79
Total	153,3			463,2	877

Taking into account that the agricultural year 2007 was characterized as a doughty year (with the main climatic features presented in table no. 2) and after the statistic calculation of the degree of attack we noticed the following results presented in table no. 3.

Table 3

Synthesis of experimental results

Var.	Degree of attack	D	Significantly
V₂	1,8440	+0,7121	xx
Media	1,1319	-	-
V₁	0,9337	- 0,1982	-
V₃	0,6181	- 0,5138	0

DL 5 % = 32,4410 % 0,3672

DL 1 % = 53,7945 % 0,6089

DL 0,1 % = 100,48 % 1,1373

CONCLUSIONS

From the synthesis table of the experimental results (table no. 3) it results that:

- the difference of the degree of attack + 0,7121 obtained for variant 2 V₂ (Golden Spur) is significantly positive as compared to the average.
- the difference of the degree of attack – 0,1982 obtained for variant 1 V₁ (Idared 1st year) is insignificantly negative as compared to the average.
- the difference of the degree of attack – 0,5138 obtained for variant 3 V₃ (Idared 2nd year) is significantly negative as compared to the average.

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