EVALUATION THE INFECTIOS PREASSURE OF SEPTORIA PIRINA FROM THE SOTHWESTERN PART OF ROMANIA

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Abstract. *In the present paper are presented results regarding the natural distribution of pathogen fungus Septoria pyrina which produce the leaf white spots on pear trees. This disease was monitored between 2021 and 2023 on the area situated in the South West part of Romania, between river Caraş and Danube. This pear trees disease has for the moment a constant presence on the area. pathogen attack is really easy to be observed because the small white to gray spots with no more than 5 mm diameter produced by the fungus when this is at maturity. But as final result of Septoria pyrina attack is the premature lose of the leaves which mean the tree has difficulties on preparations for the winter and this is the main reason why are so important this kind of surveillance on the funguses epidemiologic potential. In the same time, if there are high levels of spots on the leaves it mean that there are a lot of spores produced by fungus and the infection pressure is high. In the same time, an increased number of spots means a high number of fungus reserve for the next year infections. For this reason it is very important to keep the fungus inoculum level under surveillance and use those data for important decisions as there is the moment when it is absolutely necessary to apply one treatment against the fungus. Results indicate without any doubt that the funs is present all around the localities from the evaluated area. Never the less it is mandatory for permanent surveillance of this fungus inoculum evolution on the areas where there are pear orchards.*

Keywords*:Septoria pyrina pear tree leaf disease*

INTRODUCTION

Pear leaf spot is a common disease on some small pear trees orchards on Western part of Romania. It is very common in local pear populations and of course in pears which are from old varieties (ALOJ B. ET AL, 1994). For those pears is a common disease because they have resistance issues to this pathogen which has been overcome and take advantage by unimproved trees resistance to pathogens (SESTRAS ADRIANA, ET. AL., 2008).

From the point of view of protection against pathogens, the isolated trees maintained in gardens only for personal reasons, those trees are sources of infection for all trees that are at least of the same species (MARTIN B. ELLIS, ET. AL,1987). This is why it is essential to constantly know the level of the pathogens reserve for all crop plants of interest. In the present paper, the reserve of the fungus *Septoria pyrina.* was evaluated. which produces pear leaf spotting or pear trees septoriosis.

What is known about this pathogen is that it can be transmitted from one year to another in two forms. The first form is that of resistance mycelium in the fallen leaves in autumn at the base of the trees, this being possible in areas where the winters are mild, i.e. if the temperatures do not fall below – 10 °C for long periods of time. The second form of resistance is the sexual form (perithecia with asci and ascospores) known as *Mycosphaerella pyrina* (Ellis & Everh.) J.H. Mill. In this form, the perithecia usually starts to form starting from January, in the leaves that have fallen to the ground in autumn.

All the previously mentioned motivates, the easy and relatively simple transmission of the pathogen from one year to another, especially in the case of pears located in places where the application of integrated protection measures is not possible (pears located on public space in localities, pears from small orchards in the gardens of the population, pear trees located on

the side of the roads outside the towns, etc.). Considering the easy transmission from one year to the next we can add the very easy and effective transmission during summer and autumn in the form of pycnospores in the pycnidia formed by the main and secondary infections, (SIVANESAN A., 1990) precisely in those trees to which no measures are applied phytosanitary protection and which are excellent sources of infection (TAYLOR JE, GROENEWALD JZ, CROUS PW ,2003).

All that has been shown till this point are reasons for a permanent monitoring of the state of the reserve of this pathogen which, even if it is not difficult to fight with treatments, these treatments must be applied successively to cover the entire vegetation period (CHATZIDIMOPOULOS M., PAPPAS A.C., 2016), which is expensive both financially and in terms of ecological view. This is why for more than 4 years we have been monitoring this pathogen in the hill area in an area that is climatically favorable for both the bristles and the pathogen.

MATERIAL AND METHODS

The monitored pear trees were generally isolated on public space or in people's gardens. From this point of view, it was impossible to assess the frequency of the attack of the pathogen there are no place with ten pear trees in the same place. So, only determinations of the intensity of the attack being made (HORSFALL, J. G. AND BARRATT, R. W. 1945). However, the intensity of the attack gives a very accurate perspective of the virulence of the pathogen and from this point of view we could accurately appreciate the reserve of the pathogen.

The monitoring of the pathogen was carried out in the period 2021-2023 in the localities of Grădinari, Răcășdia, Moldova Nouă and Anina, considering that from this point of view the southwest area of Romania is completely covered from a climatic and territorial point of view (SCHRÖTT L., 1972). The data were collected between April and September, these data being used to perform statistical calculations regarding the behavior of the pathogen during the three years of observations.

RESULTS AND DISCUSSIONS

The results obtained by monitoring the fungus *Septoria pyricola* in the three years 2021-2023 were summarized in table 1, where are the monthly averages of the intensities recorded by the pathogen in the four localities: Grădinari, Răcășdia, Moldova Nouă and Anina. A first finding is that the intensity of the attack varied depending on the temperature conditions and the amount of water from the precipitation recorded in the April-September period.

The first factor is the temperature and it can be seen how in the localities the increase in height which brings a decrease in temperature in general by an average of 3-4 °C has led to a significant decrease in the intensity of the attack of the pathogen and the delay of the first attacks with a month, as can be seen from the data collected in the town of Anina. The town of Grădinari is a little atypical, being located at the base of a hill that lowers or somewhat artificially increases the temperature through weaker air currents that keep the humidity high in the morning, which leads to the artificial decrease of the temperature by 1-2°C and in the evening when the atmospheric humidity is reduced, the highest temperature recorded is extended by 1-2 hours. All of these generally influence the evolution of the life cycle of pathogens. In our case, the *Septoria pyricola* fungus had a more temperate development than in Moldova Nouă or Răcășdia, the attack intensity values being lower in the months of April and May.

Table 1

Evolution of *Septoria pyricola* attack intensity on monitored locations between 2021-2023

Nr	Factor A Location	Factor B Month	Factor C Year			Averages of factor A	Difference	Interpretation
			2021	2022	2023			
1	Anina	April	0	0	0	11.39	-3.89	00
		May	3	5	2			
		June	5	10	5			
		July	15	15	25			
		August	15	20	25			
		September	15	20	25			
2	Grădinari	April	3	3	2	11.83	-3.44	0
		May	5	5	10			
		June	10	5	15			
		July	10	10	15			
		August	20	15	20			
		September	25	15	25			
3	Răcășdia	April	5	5	5	13.89	-1.39	-
		May	5	5	10			
		June	10	10	10			
		July	20	15	20			
		August	20	20	25			
		September	20	20	25			
4	Moldova Nouă	April	5	5	10	15.28	0.00	Control
		May	5	10	10			
		June	10	10	15			
		July	10	20	20			
		August	20	20	25			
		September	25	25	30			

DL 5% = 2.36 DL 1% = 3.56 DL 0,1 % = 5.12

Table 2

Evolution of *Septoria pyricola* attack intensity on period april – september between 2021-2023

Factor B Month	April	May	June	July	August	September	Month average
Averages	3.58	6.25	9.58	16.25	20.42	22.50	13.10
Differences	-9.51	-6.85	-3.51	3.15	7.32	9.40	Control
Interpretation	oo	*	-	-	*	**	-

DL 5% = 6.13 DL 1% = 8.46 DL 0,1 % = 11.6

Table 3

General evolution of *Septoria pyricola* attack intensity between 2021-2023

Factor C Year	2021	2022	2023	Year averages
Averages	11.71	12.00	15.58	13.10
Differences	-1.39	-1.10	2.49	Control
Interpretation	-	-	x	-

DL 5% = 2.06 DL 1% = 3.14 DL 0,1 % = 5.23

Regarding the distribution mode of the attack on the April-September interval, the progressive pattern is clear (table 2), more accelerated on the April-July interval, after which the development of the pathogen decreases in August and September. The reduction in the growth rate of the aggressiveness of the pathogen is solely due to the reduction in the number of rainy days and the amount of water from precipitation. Also an important factor is the reduction in the number of days with dew, especially in low relief areas. Compared to the average of the period, the attack has the largest negative differences in April and May and the largest positive differences in August and September (table 2)

From the three-year interval in which the phytopathogenic fungus Septoria pyricola was monitored, the biggest difference from the average of the period was in the year 2023 (table 3), the annual average of the attack intensity being the highest, standing at over 15% . The other two years, for reasons related more to the evolution of climatic factors, especially in spring and summer, the intensity of the attack recorded lower values

CONCLUSIONS

1. The pathogen is spread throughout the area where determinations were made.
2. In general, the amounts produced annually by the white spotting of hairy leaves produced by the fungus Septoria pyricola are relatively dependent on climatic factors, namely the temperature, the amount of rainwater and the way the atmospheric humidity evolves.
3. Between April and September, the intensity of the attack on the hair leaves is progressive, with the end of the season registering an attack intensity of around 20%.

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