

Research on the monitoring the attack of *Coccomyces hiemalis* sin. *Blumeria jaapi* in some cultivars of cherry

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ABSTRACT

Research on the monitoring of the pathogen *Coccomyces hiemalis* sin. *Blumeria jaapi* took place on the territory of the Research Station for Fruit Growing Iasi, within the research polygon. The observations were made on 5 cultivars approved at RSFG Iasi and belong to the category of early ripening cultivars. 'Cetățuia', 'Cătălina', 'Andreias', 'Cociuvas' and 'Mihailis' cultivars were studied, their monitoring began in May, analysing 3 trees of each cultivar, 300 leaves from each tree in three repetitions, observing the frequency and intensity of the pathogen's attack. During the growing season of 2022, 4 treatments with fungicides, insecticides and foliar fertilizers were used for phytosanitary maintenance. Following the observations made, the analysed cultivars recorded a minimum attack degree of 0.825% on the 'Cetățuia' cultivar and the highest of 1.63% for the 'Mihailis' cultivar. The low degree of attack was due to the earliness of the cultivars studied.

Keywords: anthracnose, cherries, degree of attack, phytosanitary protection.

INTRODUCTION

The climatic conditions of the northeastern area of Romania are those which favor the appearance and development of pathogens in cherry plantations, so cherry plantations face the attack of *Coccomyces hiemalis* Higg and *Monilia laxa*, *M. Fructigena*, *M. The Tiniera* (Beșleagă *et. al.*, 2014).

A multi-year study reports that cherry growing and cherry production areas have been in a continuous decline. Thus, the cherry tree covered a national area of 17400 ha in 1990 and almost 28 years later only 7058 ha (Dascălu, 2020). Measures are necessary, to protect the cherry trees against the fungus *Coccomyces hiemalis* Higg, which are found over time, such as the testimonies of Lewis FH and AB Groves (1948), when they notice that the attack of the fungus has reached a significant loss of 10% in a single growing season.

MATERIALS AND METHODS

The research was carried out on the behavior of five cherry cultivars attacked by *Coccomyces hiemalis* Higg, at the experimental lot of the Research Station for Fruit Growing Iasi.

Observations and determinations were made on the frequency, intensity and degree of attack of the agent *Coccomyces hiemalis* Higg. The experience includes a number of 5 variants and each variant has 3 repetitions with 3 cherry trees. To determine the attack

caused by *Blumeriella jaapi* Higg, three trees were observed (each tree represented a repetition), during the maximum attack period when we analyzed 300 leaves (from 3 branches, located differently at the top of the trees).

Depending on the frequency and intensity of the attack *Coccomyces hiemalis* Higg, the cultivars were classified into 5 groups, as follows:

- Very light attacked (VLA, where F = 0.1 – 3%, 1 = 3%)
- Slightly attacked (SLA, where F = 3.1 – 11%, 1 = 11%)
- Attacked environment (MA, where F = 11.1 – 25%, 1 = 25%)
- Strongly attacked (SA, where F = 25.1 – 50%, 1 = 50%)
- Very strongly attacked (VSA, where F = 50.1 – 100%, 1 > 50%).

RESULTS AND DISCUSSIONS

The environmental conditions of the area where the observations were made favorably influence the attack of *Coccomyces hiemalis* HIGG, an agent that is present in the cherry plantations (Fig. 1).



Figure 1. Presence of anthracnose on the leaf

The fungus *Blumeriella jaapii* spreads in an optimal temperature range of 16-20 °C. The infection is inactive when the temperature is below 8 °C. The accentuated attack of trees is favored by years with many rainy periods and cooler summers.

In the year of the study, the climatic conditions of the vegetation period were favorable from April when the average monthly temperature exceeded the growth threshold of the fungus, registering 10.20 °C and the precipitation of the period amounted to 119.4 mm. (Fig.2). The optimum temperature for the development of the fungus in 2022 was achieved during May from 11 of the month when the trees were at BBCH stage 74-80.

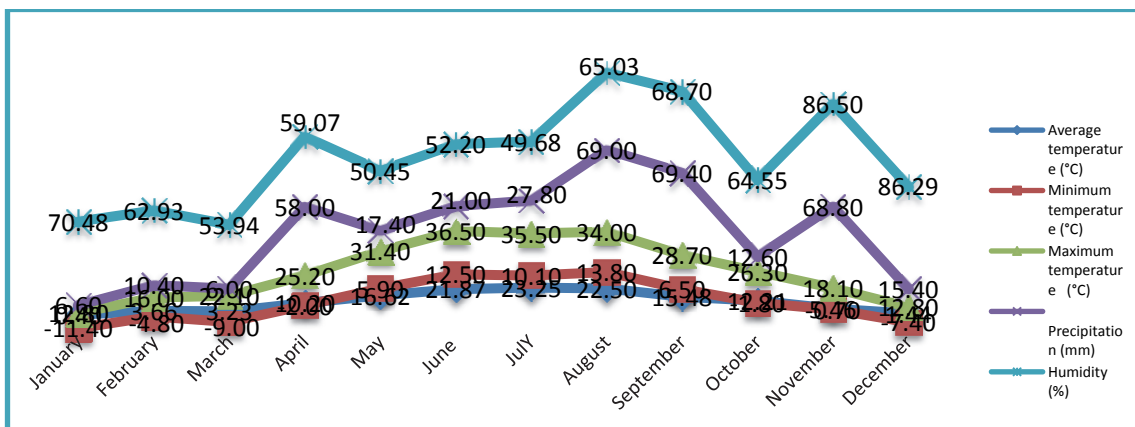


Figure 2. Climate conditions of 2022 at RSFG Iasi

Of the 5 cultivars studied (Table 1) we can see that the percentage of attack degree of the pathogen agent is between 2.36 and 4.89, being highlighted in the cultivars 'Cetățuia' and 'Mihailis' respectively.

The table below shows the situation of the degree of attack in the cultivars studied. According to the percentage registered, the cultivars fall into two classes of the 5 classifications of the attack degree. Thus, the 'Cetățuia' and 'Cociuvas' cultivars with percentages of up to 3% are ranked in the very lightly attacked class (VLA) and the 'Cătălina', 'Andreias' and 'Mihailis' cultivars are ranked in the second class of classification, slightly attacked (SLA) where the percentage is between 3.1-11%.

Table 1. Anthracnose attack degree in cherry five cultivars in 2022, in RSFG Iasi

No.	Cultivar	Attack degree%					
		Repetition			S	TOTAL	Mean
		I	II	III			
1	'Cetățuia'	1.27	0.41	0.68		2.36	0.825
2	'Cătălina'	0.95	1.08	1.18		3.21	1.07
3	'Andreias'	08	1.04	1.19		3.03	1.01
4	'Cociuvas'	0.66	1.4	0.91		2.97	0.99
5	'Mihailis'	2,09	1.9	0.9		4.89	1.63
6	<i>Average</i>	<i>1.15</i>	<i>1.17</i>	<i>0.97</i>		<i>3.29</i>	<i>1.10</i>

Among the cultivars studied, the 'Mihailis' cultivars distinguished themselves with a distinctly significant difference because showed a surplus of attack to the control (average of 0.53.)

The cultivars 'Cetățuia' and 'Cociuvas' recorded a distinctly significant difference from the control with a deficit of -0.275 and -0.11 respectively of the degree of attack.

The 'Cătălina' and 'Andreias' cultivars recorded a very significant difference in the degree of attack compared to the control, with the value of -0.03 respectively -0.09.

Table 2. The degree of attack on five cherry cultivars, at RSFG Iasi in 2022.

No.	Cultivar	Frequency F%	Intensity I%	Attack degree GA%	Difference compared to control	Significance	Classification
1	'Cetățuia'	27.5	3	0.825	-0.275	00	FSA
2	'Cătălina'	26.9	4	1.07	-0.03	000	SA
3	'Andreias'	25.3	4	1.01	-0.09	000	SA
4	'Cociuvas'	24.8	4	0.99	-0.11	00	FSA
5	'Mihailis'	40.8	4	1.63	0.53	**	SA
6	<i>Average</i>	<i>29.06</i>	<i>3.8</i>	<i>1.1</i>	<i>-</i>	<i>-</i>	<i>-</i>
		<i>DL 5% = 0.49;</i>		<i>DL1%=0.72;</i>		<i>DL 0.1%= 1.08</i>	

The cultivars observed are maintained with specific products, both for pathogens found in cherry plantations and for pests. For the agent concerned, the fungicides Bouille Bordelaise WDG and Signum (Table 3) were used for the prevention and control of anthracnose.

Bouille Bordelaise WDG is used in the BBCH 07-10 phase for curative and preventive effects in a single treatment. Signum is used in the growing period BBCH 59-81, from the opening of the first flowers to the beginning of typical fruit colouring, fungicide prevents

the germination of spores, the growth of the germinal tube and mycelium, as well as sporulation.

Table 3. Phytosanitary program applied to the cherry cultivars studied at RSFG Iasi in 2022

No.	Product	Conc.%	Dose
T1 BBCH 07-10	B. Bordelaise wdg	0.5%	5.0 kg/ha
	Mospilan 20 SG	0.03%	0.45 kg/ha
	Polyactiv B	0.1%	1.0 l/ha
T2 BBCH 65	Signum	0.05%	0.5 kg/ha
	Decis 25 wg	0.045%	0.045 kg/ha
	Polyactiv B	0.1%	1.0 l/ha
T3 BBCH 74-80	Folicur solo	0.075%	0.75 l/ha
	Rezistevo	0.4%	4.0 kg/ha
	Karate zeon	0.025%	0.25 l/ha
T4 BBCH 84	Signum	0.05%	0.5 kg/ha
	Exirel	0.075%	0.75 l/ha
	Rezistevo	0.4%	4.0 kg/ha

CONCLUSIONS

The fungus studied *Coccomyces hiemalis* HIGG sin. *Blumeria jaapi* meets in 2022 in the analyzed orchard of RSFG Iasi favorable conditions for its development. This was observed in all five cultivars studied.

Anthracoze is among the main pathogens that cause significant damage in cherry plantations, so it is necessary to include it in the fungicide treatment program to control and limit the attack produced.

The intensity of the attack of *Coccomyces hiemalis* Higg was kept under control by the use of phytosanitary treatments with specific fungicides (Bouille Bordelaise, Signum).

The plant protection products used in the treatment schemes contribute to the protection of trees with copper, pyraclostrobin and boscalid products, reducing the risk of tree defoliation and loss of plantations.

After analyzing the five cultivars of the attack of *Coccomyces hiemalis* Higg, it resulted that the 'Mihailis' cultivar was slightly more affected by the fungus than the average by a percentage of 0.53. The other four cultivars 'Cetățuia', 'Cătălina', 'Andreas' and 'Cociuvas' recorded a percentage between -0.03 and -0.275.

The reduction of the anthracnose attack can be done since the establishment of cherry plantations by choosing cultivars that shows low sensitivity to the attack of the pathogen.

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