

RESEARCHES REGARDING THE ATTACK OF THE *MONILINIA FRUCTIGENA* FUNGUS (ADERH. & RUHL.) HONEY ON SOME VARIETIES OF APPLE, HARTIESTI LOCATION, ARGES COUNTY

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Abstract

The attack of the *Monilinia fructigena* fungus responsible for the appearance of apple moniliosis is present every year, whenever this species is grown. The *Monilinia fructigena* fungus is present yearly and in orchards grown in the research area. Research has been carried out in the untreated variants of a fungal attack on varieties: Florina, Generos, Goldrush, Idared and Topaz. The attack on the sprout and the fruit was monitored and the frequency, intensity and degree of attack were calculated. Under the conditions of 2016, the attack on the sprouts registered different values of the frequency and the intensity was maximum. The highest value of the 10.5% attack was determined in the Idared variety, considered as control, followed by the Topaz and Goldrush varieties, with attack rates of 8% and 6.5%. The fruits attack noted in the summer showed a value of 11.4% for the Idared variety followed by the Topaz variety with 8.7%. The fruits attack recorded in the autumn, at the harvest was 36.6% for the Idared variety followed by the Topaz variety by 31%. The Florina variety recorded the lowest level of attack on fruits before harvesting with an attack rate of 22%. The Goldrush and Generos varieties recorded 24.5% and 28.55 attack levels for fruit before harvest. The intensity of the fungus attack on the fruit before the ride and the attack on the sprouts were considered 100%, considering that the fruits and the sprouts affected by the pathogen attack are compromised. In this case, the attack value was given by the attack incidence value. The data obtained were statistically assured.

Key words: variety, apple, fungus

Monilinia fructigena is the fungus responsible for the occurrence of brown rot in seed trees (Byrde R.J.W. *et al*, 1977; Gheorghies C. *et al*, 2001). The main host is apple. The losses caused by this fungus in apple crops are considerable (Van Leeuwen G. C. M. *et al*, 2000). The clinical picture of the disease is characterized by the blushing of the flowers, the leaves and the young fruits.

On mature fruits, depending on environmental conditions, brown rot occurs. in warm and humid weather, black rot - in cold and humid weather and mummification of fruits at the alternation of hot and humid periods with cold and wet, similar to other fungi producing rot to fruit trees and requires treatments (Popa T. *et al*, 2012; Popa T. *et al*, 2013).

Conjunctions such as *Monilia fructigena*, wintering in mummified fruits and thus providing primary inoculum in the spring attack on the shellfish.

Environmental factors, insects, birds, humans are of particular importance in the spreading of the *Monilia fructigena* infection and

the behavior of varieties is relevant in the level of the attack (Byrde R.J.W. *et al*, 1977; Holb I., 2003; Holb I. *et al*, 2008; Holb I., 2008; Lack H., 1989).

Fruit attack can continue in warehouses (Berrie A.M., 1989; Falconi G.J. *et al*, 1994).

MATERIAL AND METHOD

Observations were made in the orchard from Hartiesti, Arges County, under the conditions of 2016, and aimed at monitoring the reaction of some apple varieties to the attack of the *Monilinia fructigena* fungus in the untreated variants. Observations on the fruits were made when the attack occurred. The biological material was represented by Florina, Generos, Goldrush, Idared and Topaz. Observations have been made on the fungus attack on sprout and fruits. We noted the frequency and severity of the attack using the following formulas: $F(\%) = nx100 / N$, where: n = percentage of attacked organs, N = total number of plants analyzed and $I(\%) = \sum (ixf)/n$, where i = percentage granted, f = number of plants (organs) with the respective percentage, n = total number of attacked plants (organs) analyzed. The degree of attack was calculated by: $DA = F \times I / 100 (\%)$,

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where: F = attack frequency (%), I = attack intensity (%), DA = degree of attack. The intensity was scored percent.

Observations on the attack on the fruit were made in the brown rot phase. Microscopic identification was performed on the Zeiss Primo microscope with the Zen software (figure 1, 2). For the statistical calculation we used the program Anova.

RESULTS AND DISCUSSIONS

The microscopic identification of the fungus revealed the formation of yellowish, unicellular conidia arranged in branched chains (figure 1, 2).



Figure 1 *Monilinia fructigena* - conidia chains (Florina variety)

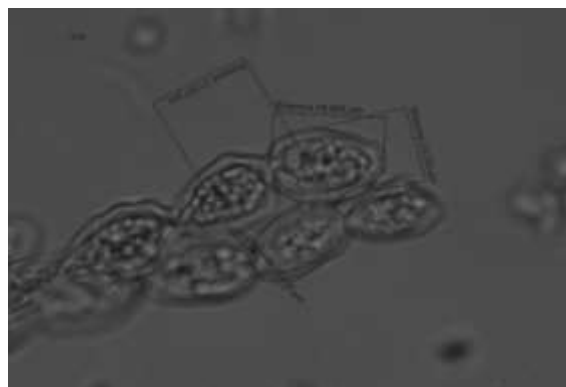


Figure 2 *Monilinia fructigena* - conidia (Florina variety)

The data (table 1) shows that the attack on the sprout in 2016 recorded frequencies ranging between 4% in the Florina variety and 8% in the Topaz variety.

The highest value of the attack incidence was calculated for the Idared variety considered also as a control, where F = 10.5%.

The Generos and Goldrush varieties recorded 4.5% and 6.5% in the attack frequency. The intensity of the attack on the sprouts was noted as the maximum value because if the sprouts were completely affected by the moniliosis are considered compromised.

In this case, attack frequency values are similar to attack rates. The data are statistically secured (table 1).

Table 1

Attack of *Monilinia fructigena* on sprout (Hartiesti, 2016)

No.	Variety	Frequency (%)	Intensity (%)	Degree of attack (%)	Difference	Meaning
1	Florina	4.0	100	4.0	6.0	***
2	Generos	4.5	100	4.5	5.5	***
3	Goldrush	6.5	100	6.5	3.5	***
4	Topaz	8.0	100	8.0	2.0	*
5	Idared (control)	10.5	100	10.5	0	
DL	5%				1.457	
	1%				2.071	
	0.1%				2.998	

Analyzing the attack of the *Monilinia fructigena* fungus on fruit phenophase half of the normal size it was found that the highest frequency value was recorded in the Idared variety with F = 17%, followed by Generos and Topaz varieties with frequencies of 14.5% and 14% (table 2).

The intensity of the attack on these varieties was: 56.6% for Idared and 52% for the Generos and Topaz varieties, resulting in an attack rate of 9.6% for the Idared variety and around 5% for the Generos and Topaz varieties. The lowest value of attack was determined in Florina variety with DA = 6.5% (table 2).

Table 2

Attack of *Monilinia fructigena* on fruits (Hartiesti, 2016)

No.	Variety	Frequency (%)	Intensity (%)	Degree of attack (%)	Difference	Meaning
1	Florina	13.5	48	6.5	3.1	**
2	Generos	14.5	52	7.5	2.1	*
3	Goldrush	13	52.5	6.8	2.8	**
4	Topaz	14	52	7.3	2.3	*
5	Idared (control)	17	56.5	9.6	0	
DL	5%				1.889	
	1%				2.685	
	0.1%				3.888	

The data (table 3) shows the result of observations on the *Monilinia fructigena* fungus attack on fruit before harvesting.

Considering the intensity of the maximum attack, the values of the frequency were also provided by the attack rate values.

The Florina variety had the lowest value of the fruit attack, 22% followed by the Generos variety with a 24.5% stake (table 3).

In the Idared variety, the highest attack value of 36.6% was obtained.

Also, in the Topaz and Goldrush varieties, attack values can be considered high, with DA = 31% and 28.5% (table 3).

Table 3

Attack of *Monilinia fructigena* on fruits, autumn of 2016 (Hartiesti)

No.	Variety	Frequency (%)	Intensity (%)	Degree of attack (%)
1	Florina	22	100	22
2	Generos	24.5	100	24.5
3	Goldrush	28.5	100	28.5
4	Topaz	31	100	31
5	Idared (control)	36.5	100	36.5

The brown rot caused by the *Monilinia fructigena* fungus produces significant damage throughout the apple vegetation period (Ivić D. *et al*, 2012).

The losses caused by the fungus attack are higher in organic apple orchards (Holb I. *et al*, 2008).

Our research has confirmed that an important role in the control of moniliose attack on apple is the apple variety, and that the attacking canals are considered high in apple orchards and untreated variants.

CONCLUSIONS

The research conducted led to the following conclusions:

The attack of *Monilinia fructigena* was common in all varieties studied on both sprout and fruit.

The Florina variety had the lowest level of attack on fruit and sprout, followed by the Goldrush variety.

The Idared variety, considered to be the control, recorded the highest value of the attack both on sprout and on fruit. The level of attack on fruit at full maturity was 36.5%.

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