ECOLOGICAL ASPECTS REGARDING BIODIVERSITY OF MICOFLORA AND FAUNA FROM CHERRY AND SOUR CHERRY ORCHARDS FROM UASVM BUCHAREST

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Abstract

Cherry and sour cherry are fruit trees, whose fruits appear first on the market. Both diseases and pests negatively influence the growth and development of fruits, the quality of fruit declining considerably, which brings important financial damage. Research on the knowledge of micoflora and fauna of cherry and cherry culture was carried out in C.D.E. USAMV - Bucharest.

Diseases and pests frequently found on cherry and cherry are: blossom blight and cherry bite. To identify the fruit affected by blossom blight, the trees were examined, determining the frequency (F), the intensity (I) and the degree of attack (D.A.%) calculated. The yellow cherry on the Vega variety was placed on the cherry, and the cherry on the Wanda variety.

Observations made on cherry blossom blight showed that Celeste was the most affected, with a 33% attack frequency, an intensity of 17.3% and an attack rate of 5.7%. The Sam, Vega and Giant red varieties exhibited a very high resistance to the blossom bligh attack. The most attacking species was Nana with a frequency of 37.5%.

As a result of catches made on *Rhagoletis cerasi*, the first catches were recorded on 26.04 (5 specimens/trap), with a maximum flight of 11 specimens/trap on 16.05, after which the number of catches began to fall up to 5 specimens/trap (13.06). In crush the maximum catch was recorded on 29.05, 13 insects/trap.

Key words: diseases, pests, cherry, cherry tree.

Cherries are the first fresh fruits of the year, and with their high content of vitamins, minerals, sugars, are the object of one of the most effective commercial activities. Fruits are intended for both fresh consumption and industrial processing as juices, syrups, compotes, jams etc.

Both diseases and pests negatively influence the growth and development of the fruits studied, the productivity of the orchard, the quality of the fruit decreasing considerably, which brings important financial loses.

Research on the knowledge of micoflora and fauna of cherry and sour cherry culture was carried out in the Experimental Didactic Field of UASVM – Bucharest, between April and June 2018.

Diseases and pests that frequently attack cherry and sour cherry in our country are: *Monilia laxa* (blossom blight), *Myzus cerasi* (the black cherry aphid) and *Rhagoletis cerasi* (cherry fruit fly). Obtaining high yields and good quality fruit is correlated with good tree health.

In our country, by neglecting the diseases and pests of cherry and sour cherry tree, about 45-100% of the harvest of mid and late ripening varieties can be lost (Rosca I., 2008; Istrate R., 2005, 2006, 2009). Numerous studies have been conducted by researchers on the importance of the use of resistant varieties and phytosanitary protection to reduce the incidence of the attack. (Roşca I., 2006; Manole M.S., 2007; Popa T., 2013)

MATERIAL AND METHOD

The determinations were made in the cherry and sour cherry orchards of USAMV Bucharest, where several varieties belonging to *Prunus avium* (*Cherry*) and *Prunus cerasus* (*Sour cherry*) were studied.

For the cherry tree the following varieties have been studied: Celeste, Summit, Vega, Skeena, Early red, New star, Kordia, Regina, Giorgia, Ferrovia, Mora di Vignola, Firm red, Giant red, Katalin, Ulster, Sam, Burlat, Hedelfinger, Cetățuia, Bigareau Burlat, Margo, Lucia.

For the sour cherry tree the varieties studied were: Northstar, Schattenmorelle, Nana, Montmorency, De Botoșani.

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The trees were planted at a distance of 4 meters between the rows and 1 meter between trees in a row, without stakes, and the shape of the crown is a vertical axis and a bush.

At the approach of fruit ripening (the third decade of May), in order to determine the phytosanitary status, all trees were examined as they are placed randomly on the rows.

Observations and harvesting of biological fauna material have been carried out during the vegetation period, from May to June.

Samples were harvested weekly, using adhesive yellow traps (Pherocon AM), installed at heights of 1.5 m and 2.5 m (*figure 1a, b*).

The adhesive yellow traps were installed on the Vega variety for the cherry tree, and on the Wanda variety for the sour cherry tree, to collect the species *Rhagoletis cerasi.*


a.


b.

Figure 1 (a, b) **Installation of adhesive yellow traps in cherries and sour cherries**

RESULTS AND DISCUSSIONS

Following the observations made on varieties from the U.S.A.M.V. Bucharest orchard, at both species were identified with the *Monilinia laxa* (Aderh. & Ruhland) Honey (*Fungi*, *Ascomycota*, *Leotiomycetes*) pathogen responsible for the occurrence of fruit blossom blight. The studied varieties may have different sensitivities to pathogen attack depending on the thickness of the cuticle. The cuticle of fruit is, generally, known to have a protective role and, in cherry fruit and cherry tree, the cuticle has been reported to take part in resistance against *Monilinia* (Brown, S., 1989).

Observations aimed to determine the incidence of frequency and intensity, based on which the degree of attack on cherries and cherries was calculated.

Aspects of blossom blight attack are presented in *figure 2*. The incidence of frequency (F%) and intensity (I%) were determined, on which the degree of attack (D.A.) of fruit blossom blight was calculated.


a.


b.

Figure 2 (a, b) **Symptom of *Monilinia laxa* on the fruit**

In cherry trees, out of the varieties analyzed, the frequency of the attack (F%) showed values of: 20% for Kordia, Bigareau Burlat 25% and Celeste 33%. The highest intensity of blossom blight was found in the Kordia variety of 18.3%, followed by Celeste with 17.3%, Bigareau Burlat of 15% and Hedelfinger of 11.7%. The Sam, Vega and Giant red varieties showed a high resistance to the blossom blight attack, and the pathogen not being detected under the randomization of the varieties. The degree of attack rate (D.A.%) had low values between 1.17% for Hedelfinger and 5.7% for Celeste (*figure 3*).

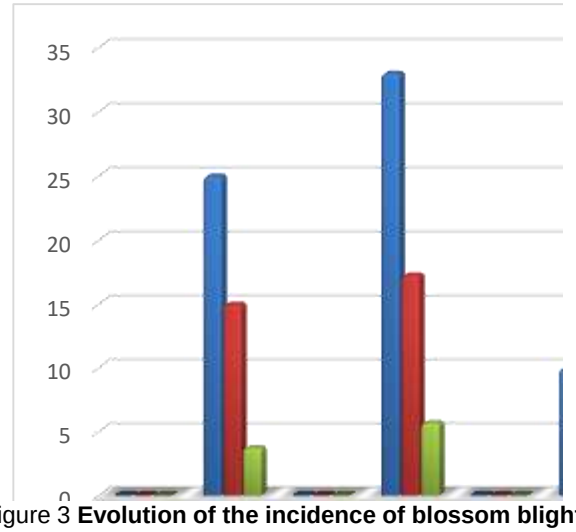

Figure 3 **Evolution of the incidence of blossom blight (*Monilinia laxa)* on cherries**

Due to the phytosanitary treatments applied periodically against diseases and pests, many of the trees did not show symptoms of attack, some of them being resistant to fruit *Monilinia laxa*.

The results show that some varieties such as Sam, Vega and Giant red are resistant to pathogenic agent attack.

For sour cherry tree the following varieties were analyzed: Northstar, Schattenmorelle, Nana, Montmorency, De Botosani (*figure 4*).

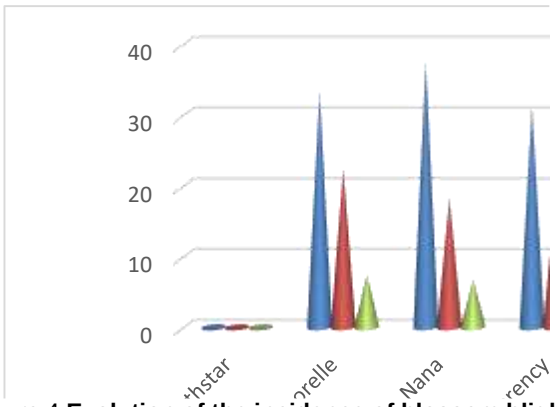

Figure 4 **Evolution of the incidence of blossom blight (*Monilinia laxa*) on sour cherries**

The *Monilinia laxa* attack presented values in frequency between 20% in the De Botosani variety and 37.5% in the Nana variety, except for the Northstar variety, without attack. The highest attack intensity was recorded in the Schattenmorelle variety of 22.5%, where a maximum attack rate of 7.49% was calculated.

The lowest value of the attack was 4% in the Botosani variety.

The attack of *Rhagoletis cerasi* species, based on catches made on the adhesive yellow traps, was separately evidenced on cherries and sour cherries (*figure 5*).

Figure 5 **Catching the species *Rhagoletis cerasi***

In the cherry tree, based on weekly catches, the dynamics of the species was established, i.e. at the beginning and end of the adult occurrence in the tree crown (*figure 6*).

The first catches of 5 adults/trap were recorded towards the end of May, early June (26.04 and 03.05).

In June, the number of catches declined to only 5 adults/trap in the second decade of the month (13.06-20.06).

During the observation period, a number of 51 catches were recorded.

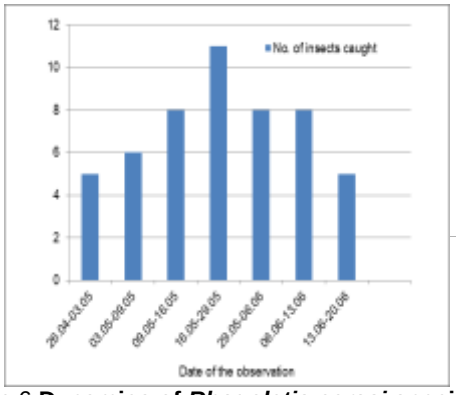

Figure 6 **Dynamics of *Rhagoletis cerasi* species in cherry**

The species population began to grow at a maximum flight of 11 adults/trap in week 16.05-29.05, period coinciding with the fruit ripening phenophase (*table 1*).

Table 1

Evolution of the species *Rhagoletis cerasi* in cherry

Date of the observation	No. of insects caught
26.04-03.05	5
03.05-09.05	6
09.05-16.05	8
16.05-29.05	11
29.05-06.06	8
06.06-13.06	8
13.06-20.06	5
Total insects	51

In sour cherry, the cherry fly appeared at the end of April with 2 adults/trap, after which the population started to increase, with a maximum flight at the end of May, early June (29.05 - 06.06) of 13 adults/trap (*table 2*).

Table 2

Evolution of *Rhagoletis cerasi* species in sour cherry

Date of the observation	No. of insects caught
26.04-03.05	2
03.05-09.05	6
09.05-16.05	7
16.05-29.05	6
29.05-06.06	13
06.06-20.06	8
Total	42

The population is less numerous in sour cherry trees, of only 42 adults, during the observation months (April, May and June).

The dynamics of the species show that the cherry fly appears in the tree crown towards the end of April, after which the population starts to grow progressively, with a maximum of 13 adults/trap in late May - early June (29.05 – 06.06), then decreases to 8 adults/trap in the first and second decades of June (*figure 7*).

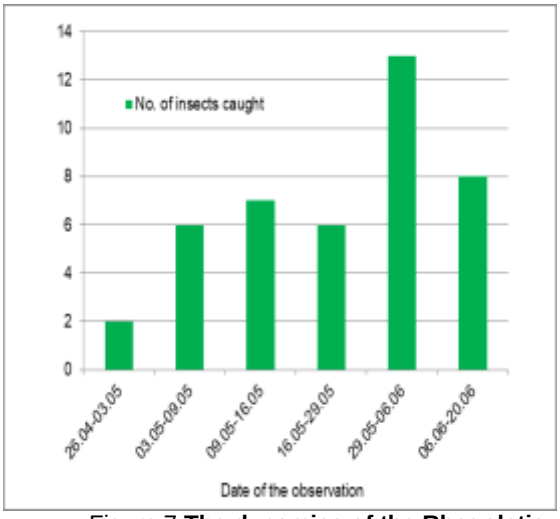

Figure 7 **The dynamics of the Rhagoletis cerasi species in sour cherry**

CONCLUSIONS

Of the cherry tree varieties analyzed, the Sam, Vega and Giant red varieties proved to be immune to attack pathogen *Monilinia laxa*, according to the description of the variety. The most affected species was Celeste, while the Kordia variety proved to be the least affected.

Regarding the sour cherry, among the studied varieties, the most affected was Nana, and the least affected was Vişinul de Botoşani.

Adhesive yellow traps show great attraction, proving useful in establishing the population level of Rhagoletis cerasi L., and its dynamics, leading to the application of warning treatments at optimum times.

Based on the observations made, it can be noticed that in 2018 the population of Rhagoletis cerasi L., showed a high density in May and June, depreciating the quality of fruits of early and mid-ripening varieties. The most intense action of the adult *Rhagoletis cerasi* on the cherry tree was carried out between May 16 and May 29, when 11 adults were harvested from the traps in the orchard.

Analyzing the sour cherry, it was found that the adult species *Rhagoletis cerasi* was more present between May 29 and June 6, when 13 individuals were harvested from the traps.

Both the action of the diseases and the action of the pests are strongly influenced by the phytosanitary treatments that are applied periodically in the orchard in order to protect the trees and to maximize the harvest.

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