

DYNAMICS OF APPEARANCE AND EVOLUTION OF THE ATTACK OF SOME VIROSIS TO THE YELLOW MELON (CANTALOUPE) IN 2002 AND 2003 - DROUGHTY YEARS, AND 2004 AND 2005 – RAINY YEARS AND TO THE WATERMELONS IN 2004 – RAINY YEAR, UNDER THE CONDITIONS OF BĂRĂGANULUI FIELD (BRAILA AREA)

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Abstract: *In the draughty years as well as in the rainy years, the yellow melons (cantaloupes) can be attacked by a series of virosis caused especially by the Cucumber Mosaic Virus – C. M. V. In the present, the dynamic of the appearance and evolution of virosis attack to the crops of Cucurbitaceae, especially to the yellow melons (cantaloupe) and watermelons was less studied. The aim of this research was to establish the moments of appearance of the attack, its evolution, the degrees of damages that the virosis can produce, as well as the possibilities of prevention and control. In this respect, the following values have been determined in the experimental field: the attack frequency (F%), the attack intensity (I%) and the attack degree (A.D.% = $Fx I/100$). As the *Cerosypha gosypii* to the cucumbers is a vector of some serious virosis to the cucurbitaceous plants (including C.M.V.) , it has also been noticed the dynamics of appearance and evolution of this pest attack, under field conditions, to the yellow melons (cantaloupes) and watermelons. During the four years of research (2002 - 2005), it was also noticed the behaviour of some species and hybrids of yellow melons (cantaloupes) and watermelons to the attack of the virosis. During these four years of*

research there were obtained interesting results regarding the attack of the virosis, the damages that this would produce beside other pathogens proper to the yellow melons (cantaloupes) and watermelons. It has been stated that the attack of the vector aphids is present every year. Though, between the intensity of the vector aphids attack and the intensity of the virosis attack there is no direct correlation. Also, each year, between the first attacks of the aphides and the first symptoms of the virosis, it passes approximately 30 days. During the four (4) years of research, during the draughty years as well as during the rainy years, the attack degree of the virosis was quite diminished at the species that have been researched. It has been stated that the older species (Hungary Treasure, Turkestan) proved to be very sensitive in some years. The hybrids created in the last years (“Galia” and “Cantaloupe”) proved to be resistant to virosis. We emphasize that the virosis to plants are diseases for which there are only preventive methods of control, and the avoidance of the damages occurred by them constitute an extremely complex problem for the entire vegetal kingdom.

Key words: *virosis, Cerosypha gosypii,, evolution*

INTRODUCTION

One of the most dangerous virosis to the species of leguminous cucurbitaceous is that one provoked by the cucumber mosaic virus (*Cucumber Mozaic Virus*). The disease was for the first time described by ZELBI in the U.S.A. in 1970. In our country, the symptoms of the disease were noticed for the first time in 1933 to the courgette.

The virus can damage all species of cucurbitaceous cultivated in our country, but it is more dangerous to the honeydew melon (*Cucumis melo*) and to the cucumbers (*Cucumis sativus*) cultivated under field conditions. The watermelon (*Citrullus vulgaris*) and the squash (*Cucurbita pepo*) are less damaged by this disease.

The plants of attacked honeydew melons show at the beginning a yellowing and a bending down of the young leaves. Later, it appears a yellow “mosaic” with small chlorotic spots and green parts definitely delimited. Sometimes, the parts normally colored become obvious as their tissues develop normally in comparison with the discolored parts where the growth is slower. This fact leads to apparition of crease and deformation on young leaves. These young leaves remain smaller than the healthy leaves. The attacked leaves reduce their growth, thus the symptom of dwarfism (nanism) being more serious as the plants had been infected from the young stage.

To the watermelon the symptoms are hardly observed because the infection is usually latent and the plants suffer much less than the honeydew melons.

In the nature, the virus spreads to over 60 species of aphids, for the cucurbitaceous the most important being the Glover (*Cerosypha gossypii*). The circle of the host plants that this virus can infect is very large, including in present over 1000 species of cultivated and spontaneous plants.

Watermelons and honeydew melons can be affected by viral diseases caused by other viruses such as: the cucumber green mosaic virus (*Cucumber Green Mottle Mozaic Virus-CGMV*), the squash mosaic virus (*Squash Mosaic Virus*) and others.

The virosis symptoms appeared during experiences with honeydew melons and watermelons mentioned before were proper to those produced by the cucumber mosaic virus (*Cucumber Mozaic Virus*).

MATERIAL AND METHODS

The experiences have been performed in Braila. There have been used on the honeydew melon the Titus species in 2002, 2003 and 2005 and the Fondant species in 2004. On the watermelon it was used the Crimson Sweet species in 2004. Experiences have been performed in accordance with the culture technology proper to the honeydew melon and watermelon.

For collection, analysis and processing of meteorological data it has been used the “Agroexpert” system of the Phytosanitary Unit within the Department of Agriculture and Rural Development – Braila.

Appearance and evolution of the virosis attack have been observed to the methods within the experiences with fungicide products, application of these products having no connection with the appearance and evolution of the virosis attack. Likewise, there has been studied appearance and evolution of the virosis attack as well as a series of species and hybrids of honeydew melon.

Experiments have been set up according to the rules of the experimental technique.

For evaluation of the attack it has been used the notification system that requires calculation of the following values: F% (frequency of the attack), I% (intensity of the attack) and AD% (attack degree). For calculation of the above-mentioned values, 10 plants from each experimental parcel have been analyzed.

Due to the fact that the cucumber mosaic virus (*Cucumber Mozaic Virus*) spreads during vegetation by the aphids *Cerosypha gossypii*, there has also been noticed the dynamics of apparition and evolution of this pest attack. There has been observed the interval between the data of the aphids attack apparition and the data of the first virosis symptoms apparition on plants.

RESULTS AND DISCUSSIONS

Observations in 2002 (hot and draughty year). The presence of the vector aphids (*Cerosypha gossypii*) was recorded in 2002 in the first decade of June in the same time with

their presence on watermelons. Though, on honeydew melons, their presence was poorer than on watermelon.

The first evident symptoms of virosis appeared on the species studied at the end of June (30th of June). These symptoms manifested by a proper, fine, interveinal mosaic, without goffering of the lamina, led to the conclusion that the cucumber mosaic virus (*Cucumber Mosaic Virus in Melon*) is present. The attack evolution was quietly slow, the attack degree increasing slowly from 0,50 % on 30th of June to 4,20 % at the end of the second decade of August. After this date the virosis symptoms started to be dominated by those of mildew and in some cases by those of verticilliosis. We emphasize that the plants which presented symptoms of virosis developed quite well, the studied species proving a good tolerance to these pathogens, while other cultivars that were the aim of the experience were much more affected.

The attack of the vector aphids (*Cerosypha gossypii*) in 2003 manifested later with approximately 10-11 days than the second decade of June from 2002.

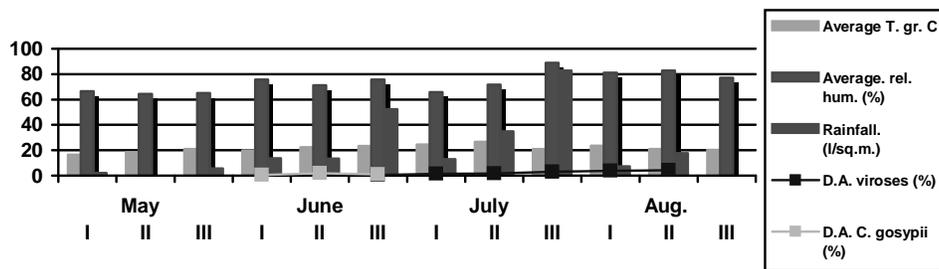


Figure 1. Apparition and evolution of the virosis attack in melons in 2002, in correlation with the Glover - *Cerosypha gossypii* (the main vector of virosis for curcubitaceous).

Observations in 2003 (hot and draughty year). The first symptoms of the virosis appeared in the first decade of July. These symptoms manifested by a fine, inter-nervure mosaic, sometimes with a slight goffering of the lamina. The symptoms were proper to the cucumber mosaic virus in melon (*Cucumber Mosaic Virus in Melon*). Some of the attacked plants manifested a slight slowdown in growth. Rarely some plants that were attacked on the secondary branching of the stalks manifested symptoms of yellowing and shortening. Though, the most of the attacked plants developed very well making fruits similar in size and taste to the healthy ones.

Starting with the second half of August, the symptoms of virosis started to be dominated by those of mildew and verticilliosis.

Observations in 2004 (rainy and cold year). The attack of the vector aphids (especially *Cerosypha gossypii*) manifested in 2004 starting with the first decade of June. The first symptoms of virosis appeared to the species studied on 4th of July as some fine interveinal discolorations accompanied by slight gofferings of the leaves. These are symptoms characteristic to the cucumber mosaic virus in melons (*Cucumber Mosaic Virus in Melon*).

It is very important to emphasize that the first symptoms of virosis appeared after a larger interval (25-27 days) since the observance of the presence of vector aphids in comparison with the previous years (2002 and 2003) when this interval was 13-15 days.

The disease developed slowly during July, the first attack degree being 0,62% and in the first decade of August it was 1,30%. Starting with the second half of August, the symptoms of virosis started to be dominated by those of mildew, becoming non-differentiated.

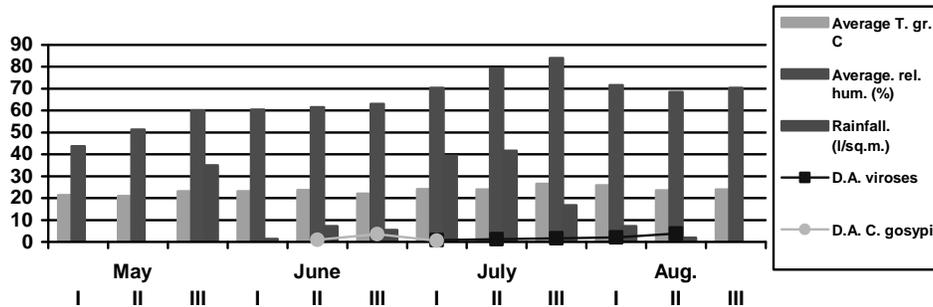


Figure 2. Apparition and evolution of the virosis attack in melons in 2003, in correlation with the Glover - *Cerosypha gossypii* (the main vector of virosis for curcubitaceous)

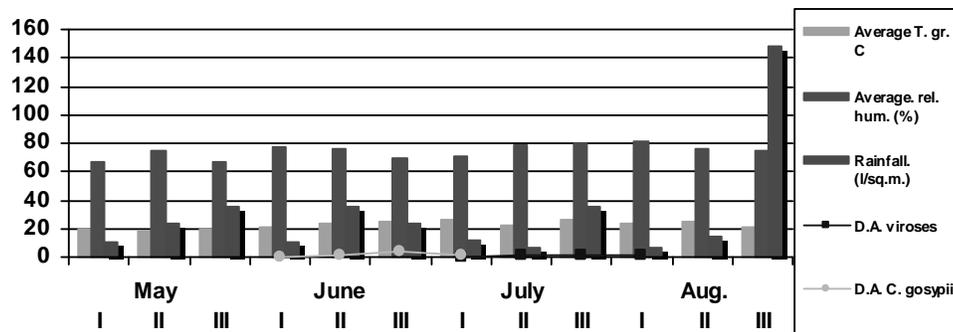


Figure 3. Apparition and evolution of the virosis attack in melons in 2004, in correlation with the Glover - *Cerosypha gossypii* (the main vector of virosis for curcubitaceous)

Observations in 2005 (rainy and cold year). The attack of the vector aphids (especially *Cerosypha gossypii*) manifested in 2005 starting with the second decade of June. The first symptoms of virosis appeared on the species studied on 14th of July, at an interval approximately equal with the one from the previous year as some fine interveinal discolorations accompanied by slight yellowing and shortening of the secondary young shoots. These are symptoms characteristic to the cucumber mosaic virus in melons (*Cucumber Mosaic Virus in Melon*).

The pathogen manifested a reduced attack degree (only 0,20%) at the beginning of the attack. Evolution of the attack from the start to the beginning of September was slow, the attack degree being 1,25% at the end of August.

It is interesting that in 2005 the symptoms of virosis could be differentiated till the end of the culture because there have been formed more short slightly yellow young shoots to the affected plants than on the affected plants from the previous years. This fact made the mildew symptoms not no dominate the virosis symptoms so much that the last ones not to be distinguished after a certain date, fact that happened in 2002, 2003 and 2004.

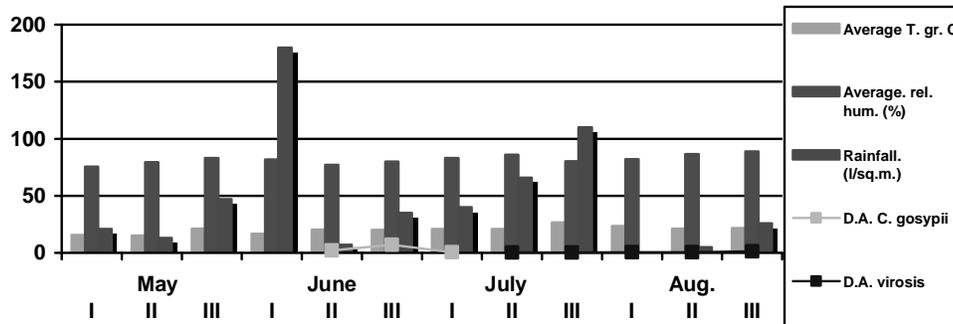


Figure 4. Apparition and evolution of the virosis attack in melons in 2005, in correlation with the Glover - *Cerosypha gossypii* (the main vector of virosis for cucurbitaceous)

CONCLUSIONS

According to the observations made during 2002-2005, it is concluded that the virosis (especially *Cucumber Mozaic Virus*- CMV) damages especially some cultivars of melons and completely isolated the watermelons.

Damages produced by virosis in melons are generally less than the ones produced by other pathogen agents, especially the mycosis. Though, under certain conditions, if the cultivated soil is sensitive, the damages can be very big.

Although the main vector - *Aphis gossypii*- has been present every year, the dynamics of virosis symptom apparition was different each year.

During draughty years (2002 – 2003) the dynamics of apparition of aphids attack was more reduced, but the virosis attack was more stronger. It has been concluded that during difficult years from the thermic point of view, the symptoms produced by virosis are more obvious and the plants are more affected.

During rainy years (for example 2004), even if the attack of the vector aphids was stronger, the watermelons were less affected by virosis.

Apparition of the virosis attack on watermelon in 2004 was surprising because during the previous years 2002 and 2003 we did not noticed it in the area where we developed our previous experiences. This apparition of the virosis on watermelon can be due to the fact that in 2004 the attack of the vector aphids in June was much more stronger than in the previous years. It is also possible the fact that changing of the location of experience might have had a contribution to this attack.

The main method of preventing virosis attack remains using the hybrid species that proved to be resistant. The lately created hybrids (“Galia” or “Cantaloupe” type) as well as some species (Ogen) showed a very good behavior to the attack of the virosis. However, the old species (Turkestan, Hungary Treasure) proved to be very sensitive during some years.

The cultures set up nearby the localities are more exposed to the attack because in the habited area there are many species of ornamental plants (most of them perennial) which can be hosts and respectively a source for the virus.

Also, it is highly recommended the set up of the culture at the beginning of the optimum period so that the flight of the vector aphids not to coincide with the young phase of the plants, when they are more sensitive.

Chemical fight of the vector aphids, especially *Cerosypha gossypii*, for cucurbitaceous did not lead to the diminishing of the virosis attack because the cucumber mosaic virus is a

“non-persistent” type. The virus can be “obtained” by the vector from a diseased plant in 5-10 seconds, than it can be transmitted to another healthy plant in less than a minute. This means that the virus can enter the healthy plant very quickly, before the insecticide to have any effect. Likewise, the virus exists in many host plants from the spontaneous flora, from where, by means of the aphid, it can quickly move to the cultures of melons, cucumbers, squashes after the effect of the insecticide went out.

It is recommended application of the insecticide against *Cerosypha gosipii*, only when it causes direct damages. There are recommended selective insecticide products for rapacious coleopterans (for example: *Coccinella*, *Hippodamia*, *Adalia* etc.) which frequently reduce population of the aphids very well, under the stage of damage.

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