

## A STUDY ABOUT THE PEST INSECTS IN THE APPLE TREES ORCHARDS, WITH LOCAL SORTS, SPECIFIC TO SIBIEL VILLAGE (SIBIU COUNTY), IN THE CONDITIONS OF THE YEARS 2015-2016

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### **Abstract**

*The presented research developed during the period between the years 2015-2016 in an apple trees orchard in the Sibiel village (Sibiu county). The purpose of the study was the identification of the entomofauna in the studied agroecosystem, the establishing of the pest attack gravity, the estimation of the pest and the suggestion of solutions. They were applied the following research methods: the direct observation on plant, the collecting of the entomological material and the attacked organs of the plants, the using of the entomological glass and the using of the photography. The application of the integrate protection and the using of the measures and means for prevention and curative treatments against the pest, on could help to obtain an important result, that represent the number one technological factor in the fruit-trees growing practice.*

**Key words:** apple trees orchards, pest fauna, Sibiel village

### **INTRODUCTION**

At the insect's populations level (and not only), the analysis of the demographical, genetical aspects or about their protection and conservation are limited by the absence of information about the movement methods that play an essential role in the establishing of the local extinction rate and the estimation of the effective dimension of the population [16]. The individuals move in a biotope for many reasons: food, reproduction, avoiding the enemies, or for better conditions of life. All these moments have a deep influence on the surviving and the reproduction rate.

The apple trees need a permanent attention to obtain a good harvest and fruit quality.

Without care and attention some apple trees could prematurely die.

It could be frustrating when the fruits harvest is destroyed because of the presence of the diseases or pests.

For rehabilitation and for a vigorous orchard it is needed to know and evaluate its phytosanitary situation [6,8,15]. Only after the establishing the answers one can make a realistic evaluation that could determine if the

rehabilitation of the orchard will be useful to obtain a good fruit production.

In the agroecosystems, the man altered the trophic relations between the populations, favouring autotrophic producers (the cultivated plant), and limiting the consuming and unnecessary autotrophic producers to man. The knowledge of the entomological biodiversity and its biological characteristics, is a very important information for decision-making and plant protection policy based on the scientific research.

The systematic studies are the basis for the knowledge of the biodiversity and comprise the discovery and description of the species, then their monitoring, attack measurement and damage assessment.

The application of the integrate protection and the using of the measures and means for prevention and curative treatments against the pest, on could help to obtain an important result, that represent the number one technological factor in the fruit-trees growing practice.

The similar studies were made by myself in the Sibiel village, but in the other years [7,9, 11-14].

Also, the studies about the pests in the apple trees orchards were effected in the Sibiu county by.

The purpose of the paper is the identification of the entomofauna in the studied agroecosystem, establishing the pest attack gravity, in order to issue solutions for improving the health of apple tree orchards in Sibiel Village.

## MATERIALS AND METHODS

The presented study about the fauna in the apple trees orchard in the Sibiel village (Sibiu county) was made in the conditions of the years 2015-2016.

In order to study the entomofauna in the proposed agroecosystem, there were used the following methods in orchard: the direct observation on plants, the collection of the entomological material and also the attacked organs of the plants, the use of the entomological glass and the using of the photography.

The captured entomofauna by means of the entomological glass was identified in laboratory. It was used the magnifying glass IOR 1983 and IPM Scope.

To analyse the apple trees orchard from phytosanitary point of view, and for the formulation of the final conclusions about the orchard situation there were necessary the periodical inspections both during the vegetative period and in the vegetative repose. In the period between the years 2015-2016, there were made some investigations in the farm to monitorize the pest agents or their attacks on the plant organs. In this period there were identified the pest factors, there were collected samples for a further identification, it was made the analysis of the soil, the evaluation of the damages and a proposal of the measures complex as efficient solutions in order to extend the age for using those trees. In order to find out the biological reserve of the trees by the coming winter, there were made tests on the surface of the leavel, fruits, branches, trunks and in soil [1-4].

It was used the notion of "the attacking degree" (GA) in order to frame the attack produced by

phytopatogenous agents (deseases) depending on frequency and intensity (force).

GA% is the expression of the extension of the attack gravity on the culture, or the total number of plants which were analyzed.

$$GA\% = \frac{F \times I}{100}$$

where: F is the frequency of the attack, i.e. the relative value of the number of plants or plants organs (n) attacked reported to the number of plants or plants organs studies (N);

$$F\% = \frac{n \times 100}{N}$$

I is a relative value which reflects the covering degree or the extinction of the attack on plant, reporting the attacked surface to the total surface observed.

It was used the noting class 6.

$$I = \frac{\sum (i \times f)}{n}$$

i – the note or the percentage of the covering attack;

f- number of attack cases at every note;

n –total number of attack cases.

## RESULTS AND DISCUSSIONS

In our country they are known about 12-15 species of pests which could compromise the production of the apple trees even 100% in case they are not under control.

The village Sibiel lies at 22 km distance from Sibiu, and it is a part of the microregion "Mărginimea Sibiului".

The studied orchard is placed at the entrance in the village Sibiel just on the Sibiu-Sibiel Road (Photo 1).



Photo 1. The apple trees orchard in the Sibiel village (Sibiu county)

The plot surface is of 1,200 m<sup>2</sup>. The sorts of the apples cultivated in the orchard are: Jonathan, Starkrimson, Red Melba, Wagner premiat. The trees are distributed in the trees rows, with a total of the 36 aplee trees.

For a complex study, the orchard was visited recurrently in order to monitorize the pests and for the identification of the attack manner on different organs of the fruitbearing trees.

The principal species representing the object of the present study belong to the Insect Class.

The insects are represented by 3 Orders: **Homoptera** with 3 species (*Aphis pomi*, *Quadraspidiosus perniciosus*, *Eriosoma lanigerum*), **Coleoptera** with 2 species (*Anthonomus pomorum*, *Scolytus mali*), and **Lepidoptera** with 2 species (*Operophtera brumata*, *Adoxophyes reticulana*). Another study about the lepidoptera species in the apples trees orchard were made in the years 2014, and 2016 [8,10,12].

By the manner of attack, damages, and by the value of the attack degree, this pest fauna could cause serious damages to the orchard.

**Homoptera Order, Aphididae Family**

*Aphis pomi* De Geer (the green couse of the apple) (Photo 2).

Poliphagous species attack mainly the apple tree.

The louses fixed themself on the inferior surface of the leaves from the top of the offshoots.

The pricked leaves, twist, turn yellow and dry them.



Photo 2. *Aphis pomi* De Geer (the green couse of the apple)

<https://www.google.ro/search?q=Aphis+pomi+De+Geer>

The frequence of attack is weak, but was present to all sorts of apples in oechard. The attack degree (G.A.) is milddle.

**Diaspididae Family**

*Quadraspidiosus perniciosus* Comst. (the San José louse), (Photo 3)



Photo 3. *Quadraspidiosus perniciosus* Comst.

<https://www.google.ro/search?q=Quadraspidiotus+pernicius>

It is an eurimer species, on localized on all plant organs, preferring the wooden parts. The attack degree has a milddle value on all the cultivated sorts, except the Jonathan sort.

**Schizoneuridae Family**

*Eriosoma lanigerum* Hansm (woolen louse), (Photo 4)

The attack on manifest itself on the trunks and branches in form of swellings. During the timee, the trees dry. The louses colonies are obvious because of the waxen secretions of withe colour that cover the colonie.

The attack degree of the woolen louse is extremely powerful on the sorts: Starkrimson, Wagner premiat, Jonathan.



Photo 4. *Eriosoma lanigerum* Hansm.

<https://www.google.ro/search?q=Eriosoma+lanigerum>

## Coleoptera Order

### Curculionidae Family

*Anthonomus pomorum* L. (Apple tree flower pest), (Photo 5)

It attacks preferentially the apples tree. The attack degree is extremely powerful, mainly to the Jonathan sorts and Golden that present antonomate flowers (in from of cloves). Because the attack degree was extremely powerful, the fruits were too little, near absent.



Photo 5. *Anthonomus pomorum* L. [4]

The apple trees that belong to the sorts: Starkrimson, Wagner Premiati, Red Melba didn't have flowers.

### Curculionidae Family

*Scolytus mali* Becht. (the big apple pest), (Photo 6)

The pest is polyphagous, and it is also on apple tree. At the powerful attack, the caterpillars could destroy all the leaves mass. This species was identified on all sorts of apples cultivated in the orchard. The attack degree was middle.



Photo 6. *Scolytus mali* Becht. (the big apple pest), [4]

## Lepidoptera Order

*Operophtera brumata* L. (Big apple tree pest), (Photo 7)

The pest is polyphagous, but it is also encountered on the apple. On strong attack the caterpillars can destroy the foliage of the tree

entirely. This species have been identified on all varieties of apple cultivated in the orchard. The attack degree was scored by the middle attack.



Photo 7. *Operophtera brumata* L. (Big apple tree)

<https://www.google.ro/search?q=Operophtera+brumata>

### Tortricidae Family

*Adoxophyes reticulana* Hb. (fruit skin pest), (Photo 8)

This is a polyphagous species, and there is also on apple tree. They were observed some larvae that attacked the leaves of the trees, twisted them in form of a cornet [10].

When the fruits are ripe (mature), they could gnaw at their epicarp (skin) producing qualitative damages.



Photo 8. *Adoxophyes reticulana* Hb. (fruit skin)

<https://www.google.ro/search?q=Adoxophyes+reticulana>

The attack degree in the orchard is a middle one for all apples sorts.

The pest degree of the fruit-bearer trees vary in general from moderate to extremely powerful.

## CONCLUSIONS

Among the 7 identified species during the period between 2015–2016, the species with the most damage degree were: *Eriosoma lanigerum* Hansm., *Anthonomus pomorum* L. In the category with a middle damage degree

are: *Aphis pomi* De Geer, *Quadraspidiosus perniciosus* Comst., *Operophtera brumata* L., *Panonychus ulmi* Koch. The species *Quadraspidiosus perniciosus* were considered as a quarantine species not a long time ago, because a powerful attack could determine the quantitative and qualitative diminution of the fruits production [10], but also the orchard drying only in a few years. The species with the smallest attack degree is *Scolytus mali* Becht. The Jonathan is the most attacked apple sort. On it there were identified almost all the pests present in the orchard.

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