RESEARCHES CONCERNING THE LIFE CYCLE OF THE FLOE – TREE CATERPILLAR (*ORGYIA ANTIQUA* L.)

CERCETĂRI PRIVIND CICLUL BIOLOGIC A OMIZII PORUMBARULUI (*ORGYIA ANTIQUA* L.)

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Abstract: *The paper presents the results about the life cycle peculiarities of the Orgyia antiqua L. (Lymantriidae, Lepidoptera) species, from 2005-2007 in the Mehedinti County. In Romanian specialised literature investigations concerning this defoliator caterpillar are scarce and incomplete. The investigations were carried out in field conditions using the entomological insulators for obtaining the data for the biological card and then for the synthesis table, which will be associated with climatic data for the presentation of this pest life cycle. It results that during three years the pest had one generation per year and hibernated as egg. The larvae appears generally in the first or second decade of May at a main sum of effective temperatures* $\Sigma = (t_n\text{-}t_0) = 1507{,}10^{o}C$. *For the investigated zone the researches are absolutely new and also it completes the data about the defoliator caterpillars from our country. Because there are scarce data in Romania the researches can be extended, the pest being one of the most damaging defoliators. The paper contributes with its new data to the completion of the knowledge concerning the sloe-tree caterpillar (Orgyia antiqua L.).*

Rezumat: *Sunt prezentate rezultatele privind particularităţile ciclului biologic al speciei Orgya antiqua L. (Lymantriidae, Lepidoptera) din judeţul Mehedinţi în perioada 2005-2007. Cercetări în literatura română privind omizile defoliatoare sunt rare şi incomplete. Investigaţiile au fost realizate în condiţii de câmp folosind izolatoare entomologice. Au fost obţinute date în vederea completării fişei biologice apoi a tabelului de sinteză care a fost asociat cu datele climatice pentru prezentarea ciclului biologic al acestui dăunător. A rezultat că în cursul a trei ani, dăunătorul a prezentat o generaţie pe an şi iernat ca ou. Larvele au apărut în general în prima decadă a lunii mai, la o sumă medie a temperaturilor efective* $\Sigma=(t_n\text{-}t_0) = 1507{,}10^{o}C$. *Cercetările din zona investigată sunt noi şi aduc completări la datele privind omizile defoliatoare din ţara noastră. Deoarece există puţine date în România, cercetările pot fi extinse, dăunătorul fiind unul dintre cei mai periculoşi defoliatori. Lucrarea contribuie prin datele sale noi la completarea cunoştinţelor privind omida porumbarului (Orgyia antiqua L.).*

Key words: *Floe-tree, caterpillar, Orgyia antiqua L., apple, orchards, defoliator, life cycle.*
Cuvinte cheie: *Omida porumbarului, Orgyia antiqua L., livezi, măr, defoliatori, ciclul biologic.*

INTRODUCTION

In the last years the defoliator caterpillars caused great damages in the apple orchards especially in the hilly zone, near the forests. One of the identified defoliator species was the floe-tree caterpillar - *Orgyia antiqua* L. (*Lymantriidae, Lepidoptera*), (Figure 1, a; b).

In Romania the data concerning this pest are relative scarce in corporation with other defoliator caterpillars. Some information was given by PERJU et. all (1976), IORGA (1980), LEFFTER, MINOIU (1990), PAŞOL et all. (1995), TEODORESCU et all. (2003), OLTEAN (2003). In the international specialised literature, references concerning the biology and ecology of the floe-tree caterpillar were published by KEILBACH (1966), JACOBS, RENNER (1988), ALFORD (1992) in Germany, by BALACHOWSKY (1972) in France, by CHINERY (1984) in Great Britain, by ZECEVIČ (2003) in Serbia (Timoc), POPA et all. (2003), in the Moldavian Republic and Romania.

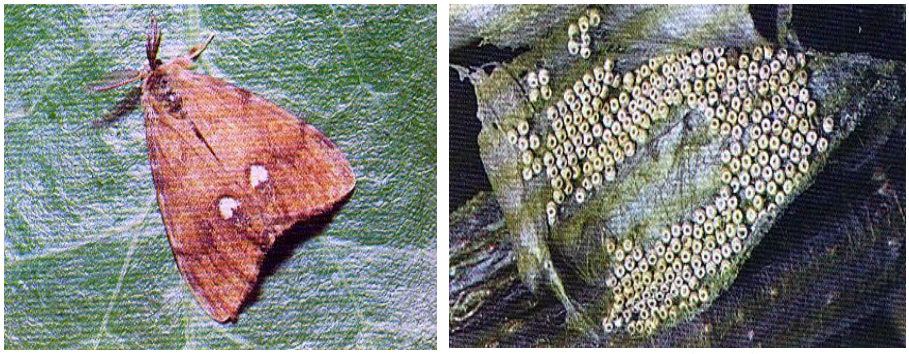


Figure 1 - Floe-tree caterpillar *Orgyia antiqua* L. a - adult, b - eggs (After Alford 1992)

In our country profound and complete researches regarding the *Orgyia antiqua* L. species do not exist and in the Mehedinti County, as in other zones of Romania, data concerning the treatments warning are totally missing.

In this context the paper presents the obtained results in floe-tree caterpillar life cycle peculiarities investigation, with the aim of an efficient control. Up to now in Romania there is not established for this pest the life cycle treatments warning.

MATERIAL AND METHOD

The researches were carried out in 2005-2007 in the apple orchards from Izvoru Bârzii, Mehedinti County.

In field conditions growth cages and entomological insulators were used for observations. Starting with the winter the cages and insulators were controlled daily, according to the actual methods for prognosis and treatments warning SĂVESCU, RAFAILĂ (1978).The data concerning the different insect instars for biological card, the climatic data for sum of effective temperatures calculation were registered. The registering of the results was done in the synthesis table. Finally were traced the life cycle and climatic data in the specific figure.

RESULTS AND DISCUSSIONS

From the obtained results concerning the life cycle of *Orgyia antiqua* L. it resulted that the pest had one generation per year and hibernated as egg (COJOCARU 2009).

Daily observations were carried out in the period 2005-2007 and the biological cards were realised. Based on the biological cards were made the pest`s life cycle.

In 2005 the sum of the effective temperatures for one generation development was 1268.5ºC and for the larval instar it was 154.5ºC. The first larvae were noticed on May 11 and the last larvae on August 15 (table 1).

Table 1

Synthesis table of the floe-tree caterpillar *Orgyia antiqua* L. Izvoru Bârzii 2005

Development stadium	First apparitions	Last aparitions	∑ (tn-to)
Larvae	11 V	15 VIII	154,5
Pupae	25 VII	21 VIII	938,3
Adults	14 VIII	18 IX	1218,8
Eggs	19 VIII	17 V	1268,5

The climatic conditions presented mean high temperatures beginning with second decade of May, the relative air humidity oscillated between 60-80%. The most important amounts of precipitations were registered in the second and third decade of May (figure 2).

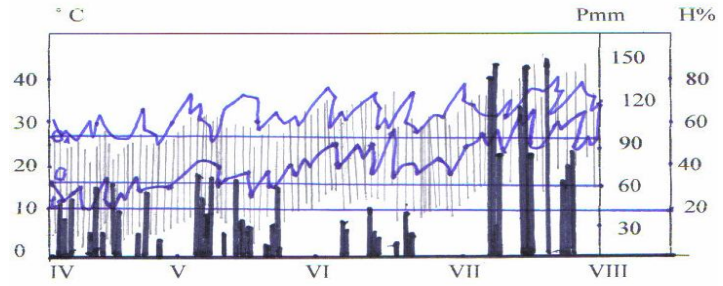


Figure 2. Climatic data of Drobeta Turnu Severin zone 2005

The treatments' warning was established in the second decade of May.

In 2006 the sum of the effective temperatures for one generation development was 1289,6ºC and also for larval instar was 142,8ºC (table 2).

Table 2

Synthesis table of the floe-tree caterpillar *Orgyia antiqua* L. species evolution Izvoru Bârzii 2006

Development stadium	First apparitions	Last aparitions	∑ (tn-to)
Larvae	9 V	17 VIII	142,8
Pupae	27 VII	19 VIII	1025,8
Adults	12 VIII	22 IX	1239,9
Eggs	17 VIII	14 V	1289,6

The first larvae were signalled in first decade of May and the last larvae in the second decade of August (figure 3).

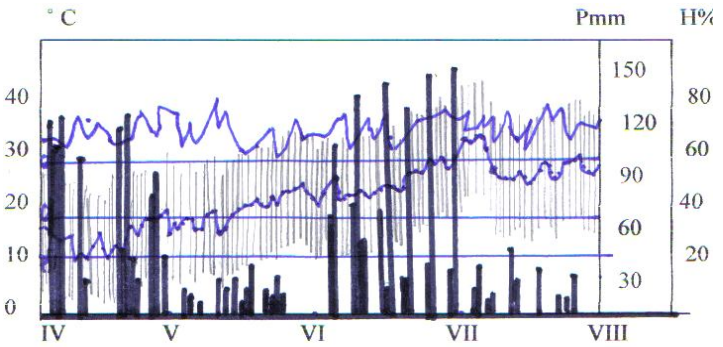


Figure 3. Climatic data of Drobeta Turnu Severin zone 2006

The mean temperatures presented highest values in first decade of August and relative air humidity in the third decade of June. The treatments' warning was established in the second decade of May.

In 2007 sum of the effective temperatures for one generation was 1693.2ºC and for larval instar it was 212.8 ºC (table 3).

Table 3

Synthesis table of the floe-tree caterpillar *Orgyia antiqua* L. species evolution Izvoru Bârzii 2007

Development stadium	**First apparitions**	**Last aparitions**	**∑ (tn-to)**
Larvae	3 V	15 VIII	212,8
Pupae	20 VII	17 VIII	1540,6
Adults	5 VIII	20 IX	1882,7
Eggs	11 VIII	11 V	1963,2

First larvae (figure 4) were signalled in the first decade of May and the last larvae in the second decade of August. The mean temperatures presented high values especially in the second decade of August. The relative air humidity oscillated between 80-100%. The most important precipitations amounts were registered in May and then in June (figure 5).

The treatments' warning was established also in the second decade of May (figure 6).

Like the other defoliator caterpillars, warning treatments are based on the biological criterion, respectively the estimation of the caterpillar nests density.

The treatments will be applied when much of two nests per one tree will be registered.

In three years effective sum of temperatures for one generation development was in main 1507.10ºC and for the larval instar of 170,03ºC.

According to the obtained data the treatments warning can be established in the second decade of May before the mass development of the larval population.

Figure 4. *Orgyia antiqua* L. - floe-tree caterpillar (http://www.fotonatura.org)

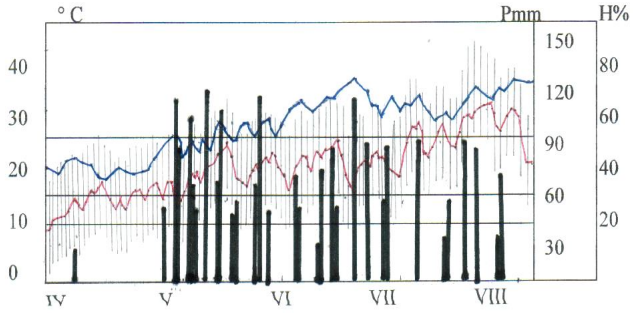
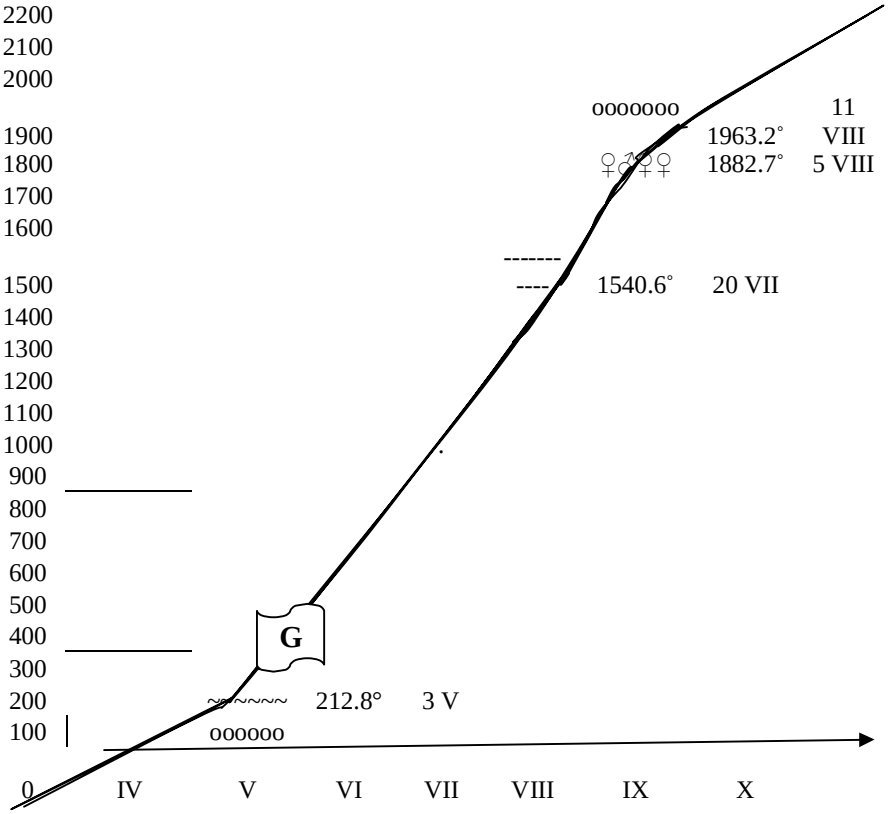


Figure 6. Floe tree caterpillar (*Orgyia antiqua* L.) life cycle draft



The obtained results contribute to the supplement of knowledge concerning the biology and ecology of floe-tree, caterpillar (*Orgyia antiqua* L.) in Romania. The treatments warning for the Mehedinti County constitute a new element in plant protection activities from the investigated zone.

CONCLUSIONS

The sum of the effective temperatures for one generation development of *Orgyia antiqua* L. species is an average of 1212.8ºC.

The sum of the effective temperatures for the larval instar was an average of 170.03ºC.

In three years the first larvae were signalled in the first decade of May and the last apparitions were signalled in the second decade of August.

The treatments warning will be made in the second decade of May.

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