THE INFLUENCE OF THE ATTACK OF FUNGUS TAPHRINA DEFORMANS (BERK) ON THE ACTIVITY OF PEROXIDASE AT REDHAVEN AND REDSKIN SORTS OF PEACH

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Abstract: *Taphrina deformans is the causal agent of a worldwide disease – peach leaf curl- which can cause early defoliation of the trees and crop loss on peach and nectarine sorts. The fungus attacks especially the leaves, and in a smaller measure, the sprouts, the flowers and the fruits. The leaves presents blotches or blisters on their superior face and dimples on the inferior one; in the beginning, these are red and later they became brown and decay because of the necrosation of the tissues; because of the attack, leaves fall down massively, a fact that causes a quick decline of the peach trees. The attacked sprouts remain shorter, are deformed and thickened. In this paper is presented the variation of the peroxidase in healthy and diseased leaves at Redhaven and Redskin sorts of peach.*

Key words: *Taphrina deformans, peroxidase, Redhaven, Redskin*

Introduction

The mycoses of the peach are described in many speciality papers, the simptomatology and the biology of the pathogen agents implicated in this diseases (Bontea, 1985; Eliade, 1983; Mititiuc, 1980, 1994).

The biothrophic fungi of genus Taphrina Fr. are pathogens on ferns and higher plants. This dimorphic fungi have a saprophytic stage and a parasitic mycelial stage on plant host, causing caracteristic morphological changes on infected plants: „leaf curl", „witches brooms", spots on leaves or deformes fruits (Bacigálová, 2003).

The disease - peach leaf curl - was observed for the first time in England in 1821 and the pathogen agent – Taphrina deformans, was described in 1857 by Berkley (Mititiuc, 1994).

The morphology and cytology of the fungus Taphrina deformans is wellknown because the description made by Sadebeck (1893), Pierce (1900) and Martin (1940), physiological and biochemical researches of this pathogen agent were made by Raggi (1967, 1987, 1994, 1995), Syrup (1975, 1976), Rossi (2007). In Romania, researches concerning the morphology, cytology and physiology of Taphrina deformans were made by Stoian (1991), Teodorescu (1995), Georgescu (1998, 2000, 2001), Trandafirescu (2006).

The peroxidase (EC 1.11.1.7) play a special role in plants metabolism, as this oxidoreductase is involved in the descomposition of hydrogen peroxide (H_2O_2), which appeares in vegetal cell under the action of different factors.

Materials and methods

The investigations have been performed in may-june, 2007, at two sorts of peach, Redhaven and Redskin, cultivated in the experimental field of the Pomiculture Research Station Miroslava, Iaşi, on healthy and infected leaves by ***Taphrina***

deformans, in different phenological phases of the trees.
The peroxidase activity has been determinate using the o-dianisidine method. This method is measuring the oxidation product of o-dianisidine with the aid of hydrogen peroxide in the presence of peroxidase (Cojocaru, 2005).

Results and Discussion
The results of the investigation concerning the peroxidase activity at two sorts of peach: *Redhaven* and *Redskin*, in healthy and infected leaves, are presented in figures 1 -2.
In figure 1 is presented the activity of peroxidase in healthy and infected leaves at Redhaven sort.

In healthy leaves, the activity of peroxidase registered the smallest value - 0,0533 U.P./ g.min at 23.06.2007, followed in increasing order by the values determinate at: 19.06.2007 (0,1072 U.P./ g.min), 11.06.2007 (0,4121 U.P./ g.min), 2.06.2007 (0,8645 U.P./ g.min), 23.05.2007 (0,8844 U.P./ g.min) and 14.05.2007 (1,1827 U.P./ g.min).

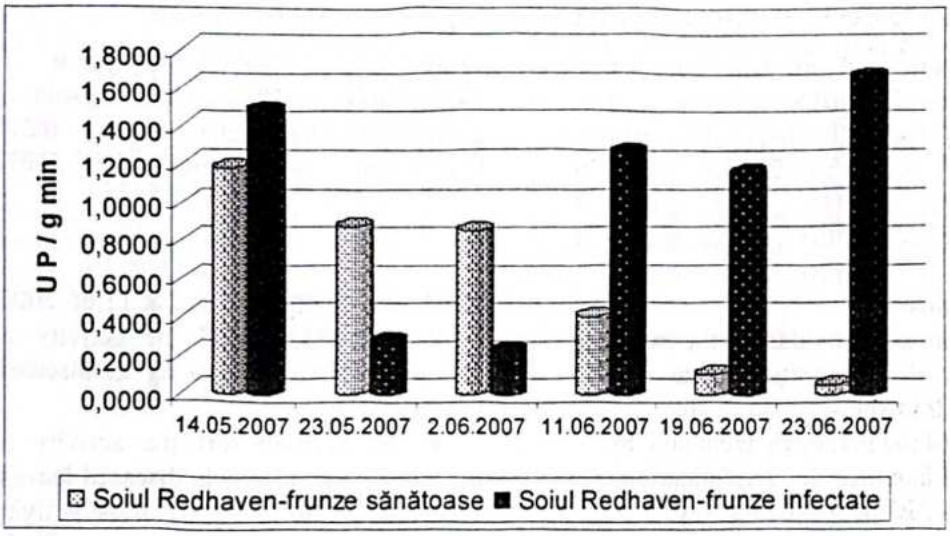

Figure 1 The activity of peroxidase in healthy and infected leaves of peach.

The activity of peroxidase in the leaves parasited by *Taphrina deformans* , at Redhaven sort, had the highest value - 1,6667 U.P./ g.min at 23.06.2007, followed in decreasing order by the following values: 1,4894 U.P./ g.min (14.05.2007), 1,276 U.P./ g.min (11.06.2007), 1,1669 U.P./ g.min (19.06.2007), 1,6667 U.P./ g.min (23.06.2007), 0,2803 U.P./ g.min (23.05.2007), 0,2298 U.P./ g.min (2.06.2007).

The activity of peroxidase at the Redskin sort, in healthy leaves, is presented in figure 2, from which results that this enzyme had the highest value at 23.06.2007 (0,4568 U.P./ g.min) followed in decreasing order by the next values: : 0,4446 U.P./ g.min (11.06.2007), 0,4184 U.P./ g.min (14.05.2007), 0,2428 U.P./ g.min (23.05.2007), 0,3081 U.P./ g.min (19.06.2007) , 0,3561 U.P./ g.min (2.06.2007).

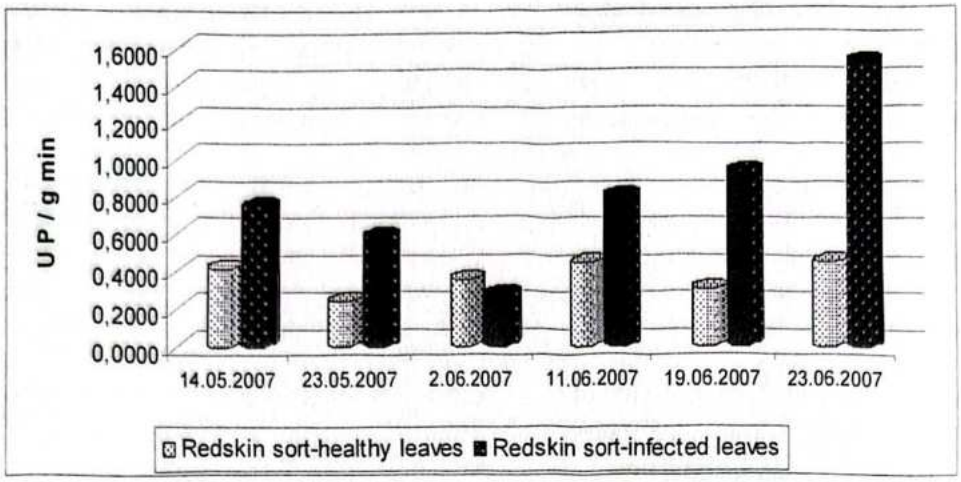

Figure 2 The activity of peroxidase in healthy and infected leaves of peach.

At the same sort of peach, in leaves infected by Taphrina deformans, were registered the following values of the peroxidase activity: 1,524 U.P./ g.min at 23.06.2007, 0,9415 U.P./ g.min (19.06.2007), 0,8063 U.P./ g.min (11.06.2007), 0,7492 U.P./ g.min (14.05.2007), 0,5857 U.P./ g.min (23.05.2007), the smallest value - 0,277 U.P./ g.min., was registered at 2.06.2007.

Conclusions

The activity of peroxidase at the two sorts of peach which were studied, was influenced, by the sort and by the presence of the pathogen agent and by the period in which the determinations were made, in the following way:

- The activity of peroxidase at *Redhaven* sort had the highest value in healthy leaves, at 14.05.2007, 23.05.2007, 2.06.2007 and at 11.06.2007, 19.06.2007, 23.06.2007 the activity of this enzyme was increasing in diseased leaves.
- At *Redskin* sort the activity of peroxidase was higher in diseased leaves, excepting 11. 06. 2007, when the activity was more intense in healthy leaves. In general, the peroxidase activity is more intense in infected leaves.

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