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RESEARCH REGARDING THE PH INFLUENCE, ENERGETIC SOURCES AND SOME CROP ENVIRONMENTS UPON THE *STIGMINA CARPOPHILA* FUNGUS BIOLOGY

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Abstract

Stigmina carpophila (Lév.) is a fungus which induces a certain disease, which destroys the leafs and stains the fruit.

This disease is displayed on the leaves, fruit and young scions, but the most important damage is provoked on the tree branches, this being a reason for which the gardeners are forced to pick out whole branches every year, so that, after 7-10 years, in that specific tree only a few branches remain, with weak growth and minimum fruit production.

It is often met in all trees which make fruits, and the largest losses are ecountered in apricot and peach.

The intense attacks appear in rainy springs, which follow after gentle and soft winters, when the reproductive organs resisted in a very high number.

In this project we observed the Stigmina carpophila fungus behaviour under the pH influence, growing on certain crop environments and the transformation of some carbon and nitrogen sources.

The biological material used was displayed by the leaves, the scions, fruit, flowers and burgeons of the tree species.

Isolation of the pathogen was made on a crop field which was frequently used, formed of potato-glucose-agar (CGA).

INTRODUCTION

The pH values' influence upon the fungus colonies development which was taken into study was made by using the CGA environment crop on which we modified the pH value, by using NaOH or HCl, for each variant.

In order to closely follow the way in which the fungus transforms the carbon and nitrogen source from different sources on which it develops, the Czapek was used, and the carbon source was replaced with different monozaharides and polizaharides, and the nitrogen source with organic and anorganic substances. The Czapek environment was less favorable to the fungus growth, therefore it was improved and amended by adding yeast, which favoured growth and fructification.

MATERIAL AND METHODS

The fungus was moved on crop mediums with pH values between 3 and 11. The colonies diameter was measured at a 3 days interval, and at the same time the fructifications appearance was closely tracked. This experiment was made on a 15 days period.

Also, after 15 days, while the fungus was kept under observation and at a 22ºC temperature, on other different crop environments the formation of a vegetative mass and the fructifications appearance were noted.

RESULTS AND DISCUSSION

The pH values of the substratum on which the fungus grows influence the development and the fructification.

From table 1 we can observe that there is a large spectrum, the colonies forming a good vegetative mass, with the reproductive organs' appearance on pH 3 values; these are optimal values, because they are contained in between 4 and 7. Along with the environment alcaline substances, the fungus was developed with a weaker vegetative mass, but continued to fructify very well.

Table 1

pH values influence upon the *Stigmina carpophila* fungus development

pH Values	Colonies' diameter (mm)
3	45 (mv ++, fr. ++)
4	50 (mv +++, fr. +++)
5	50 (mv +++, fr. +++)
6	50 (mv +++, fr. +++)
7	50 (mv +++, fr. +++)
8	40 (mv ++, fr. ++)
9	40 (mv ++, fr. ++)
10	40 (mv ++, fr. ++)
11	25 (mv ++, fr. ++)

legend: mv ++ - good vegetative mass
mv +++ - very good vegetative mass
fr. ++ - good fructification
fr. +++ - abundent fructification

The energetic sources are determiners in the *Stigmina carpophila* fungus's colonies development.

From table 2 it can be seen that the fungus transforms very well the carbon from the monosaccharides: glucose, dextrose, levuloză, maltose, manose, arabinose, levulose and ribose.

On a substratum which has an amount of polysaccharides,with more celulose, the development of the fungus colonies is weak, and the transformation of carbon from starch is relatively good.

These prefferences of the fungus prove that this species capacity of producing a disease on the green organs (leafs and fruits), but also on wood, is more powerful in autumn when the leafs fall, when natural gates of infection are created, knowing that a wound stays open for 46 days.

From table 3 it can be seen that the fungus easily transforms the nitrogen from the anorganic substances, such as potasium nitrogen and rarely the amonyum nitrogen and also the monyum phosphate. This proves that the potasium nitrogen's presence which was managed into the soil makes the infections produce easier. The infections are produced by the *Stigmina carpophila* fungus. The same happens with the urea from which the fungus slowly tranforms the nitrogen.

Table 2

Colonies growth on different carbon sources

Carbon sources	**Colonies' development of the *Stigmina carpophila* fungus**
Monosaccharides	
Glucose	Rich vegetative mass, tough body of brown colour, good multiplication
Dextrose	
Levulose	
Maltose	
Manose	
Arabinose	
Levulose	
Sorbose	Very weak vegetative mass, without fructifications
Ribose	Rich vegetative mass, tough body of brown colour, good multiplication
Polysaccharides	
Celulose	Weak vegetative mass, body developed in the substratum, weakly pigmented in yellow-brown, weak multiplication, towards the colony's center
Starch	Weakly developed body, in concentric circles, very weak pigmentation, good multiplication, the reproductive organs are set in a concentric way

Table 3

Colonies growth on different nitrogen sources

Nitrogen source	Colonies development of the *Stigmina carpophila* fungus
Inorganic substances	
Potasium nitrogen	Rich vegetative mass, silky body, of brown-yellowish colour, very good multiplication
Amonyum nitrogen	Limited growth, weak vegetative mass, harsh, of brownish-wellowish colour, weak fructification
Amonyum phosphate	Limited growth, poor vegetative mass, harsh aspect, of brown-yellow colour, not uniform, the reproductive organs are not formed
Organic substances	
Urea	Rich vegetative mass, tough body, of brown-wellow colour, not uniform, with yellow areas, irregular edges, good multiplication
Aspargine	Abundant vegetative mass, tough body, of brown-yellow colour, good multiplication

From table 4 we can see that the environments which have a content of oat, wheat, barley determined a very good growth of the vegetative mass and the abundent formation of reproductive organs.

Table 4

***Stigmina carpophila* fungus development on different crop environments**

Crop environment	Colonies development after 15 days
Natural environments	
Oat flower	Rich vegetative mass, abundent number of reproductive organs
Wheat flower	
Barley flower	
Semi-synthetic environments	
CGA	Rich vegetative mass, very good fructification
Malt extract	
Synthetic environments	
Czapek	Very weak vegetative mass (35 mm), did not fructify
Leonian	

The semi-synthetic CGA crop environments and malt 2% favoured the colonies formation, which have a morphological aspect, specific to the fungus, and a very good fructification.

The synthetic environments Czapek and Leonian stopped the vegetative development of the fungus, and the fructifications were absent.

CONCLUSIONS

1. The fungus presents a large area of development on substratum with pH values from acid to strong alcaline, with an optimal growth on substratum with weak acid or neutral pH.
2. Urea fertilisation and potasium nitrogen will be avoided, because they favour infections with *Stigmina carpophila*.
3. *Stigmina carpophila* develops extremly well on natural crop environments.

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