CONTRIBUTIONS REGARDING WOODS FUNGI ATTACK IN SOME FORESTS FROM SUCEAVA DEPARTAMENT

CONTRIBUŢII PRIVIND ATACUL CIUPERCILOR LIGNICOLE ÎN UNELE ARBORETE DIN JUDEŢUL SUCEAVA

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Abstract. *The paper content the impact of woods fungi of the forestry species in some forests of Suceava district. The study is to bring certain contributions regarding the fungi attack on beech species, focusing mainly on the attack produced by woods fungi, beyond the large economic damages, these fungi also affects the stability of the forest ecosystems.*
Key words: woods fungi, attack, damages.

Rezumat. *Lucrarea tratează impactul produs de ciupercile lignicole asupra speciilor forestiere din unele arborete ale Judeţului Suceava. Studiile aduc o serie de contribuţii privind pagubele produse de acţiunea acestor ciuperci şi influenta lor asupra stabilităţii ecosistemelor forestiere.*
Cuvinte cheie: ciuperci lignicole, atac, daune.

INTRODUCTION

The xylophagous fungi, by the frequency of the attack and localization, can affect together with other biotic and abiotic factors the quality of wood.

The fungi that produce the putrefaction of wood are generally localized, at the level of the duramen (C., Delatour, 1990; M., Mititiu, V., Iacob, 1997). The process of destructing the wood structure is evidenced in function of each phase of coloration and putrefaction, from the incipient structural deregulation until the disorganization of tissues and the apparition of the destructive or corrosive dote (Marcu, 2005).

The thematic of the paper is motivated by the great spreading of the lignicolous fungi in the coniferous woods from the department of Suceava, considered the main factors that affect the quality of wood. The studies made bring a series of data regarding the amplitude and the intensity of the dote produced by the lignicolous fungi especially concerning the attack of the *Hereobasidion annosum* (Fr. Bref.) fungus, dominant species in the studied area. The paper has at its base the results of the researches made in the area (R., Ichim, 1993; I., Sima, 1982; M., Grudnicki, 2002; N., La Porta, M., Grudnicki, K., Korhonen, 2005) and the own researches, based on measurements and observations effectuated in different experimental surfaces.

MATERIAL AND METHOD

The studies were effectuated in the Pojorâta Forest District (lots 118 D, 134 M, 138), the basic criterion of the chose being determined by the proportion of trees affected by the lignicolous fungi. In these arboretums were placed trial surfaces of 500

m^2 in which the trees were described and then sounded with the Pressler drill with the aim to extract the growing carrots.

These ones were submitted to the direct observation for determining the proportion of trees affected by dote, at the level 1,3 m, standardized for this kind of measurements. Further, the carrots were introduced on culture areas with the aim to confirm the presence of the *Heterobasidion annosum* (Fr.Bref.) fungus.

Thus, we determined the proportion of the trees affected by this fungus and the proportion of the trees affected by other species of lignicolous fungi identified according to the specific symptomatology and the presence of the carpophores. The data from the area were processed through statistic methods (Giurgiu, 1972).

RESULTS AND DISCUSSIONS

As results from the table below the chosen arboretums present a relative homogeneity from the point of view of the structure, the type of flora and ecosystem, the variability being surprised at the level of the altitudinal conditions and of the age of the arboretums.

In the studied lots, the proportion between the healthy trees and the ones attacked by the lignicolous fungi is presented in the figure 1.

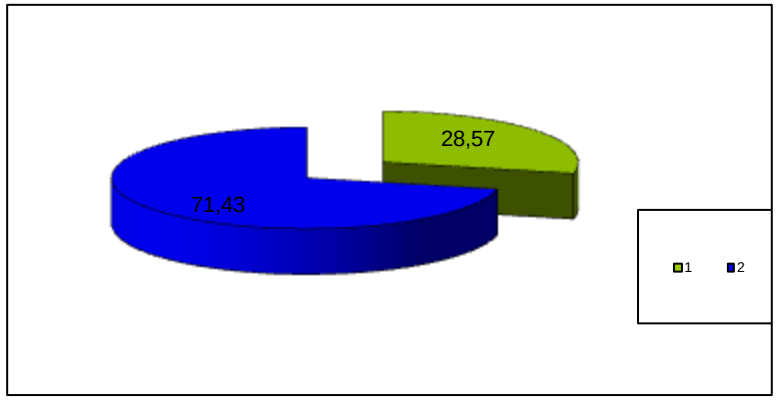

Fig.1. The proportion between the healthy trees and the affected ones
1. healthy trees; 2. attacked trees

The analysis made evidences the fact that in the arboretum with a very high level of the damaged trees (71,43%) the dote is the result of the attack produced by *Heterobasidin annosum* (Fr.) Bref. (53,85%) of the number of analysed trees. At a percent of 46,15% the discovered dote is due to the attack produced by other species of lignicolous fungi.

The graphic from the figure 2 illustrates for the lots included in the study the proportional levels of these parameters.

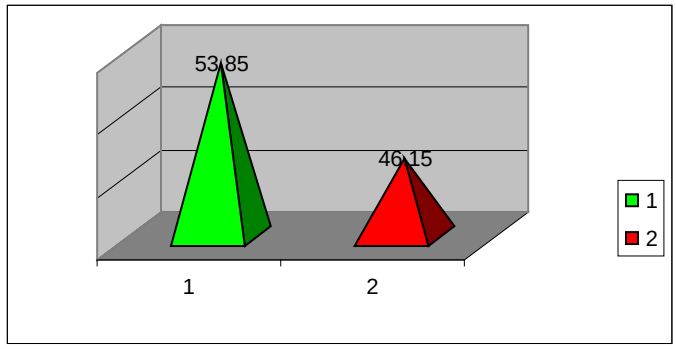

Fig. 2.The proportion of the attack of the *Heterobasidion annosum* (53,85%) fungus in comparison with other lignicolous fungi (46,15%).

The distribution of fungi on species is the following: *Heterobasidion annosum* (Fr.) Bref. (53,85%); *Phellinus pini* (Th. et. Fr.) Pil. (25,24 %); *Stereum sanguinolentum* (A.et S.) Fr. (7,69); *Fomes marginatus* (Fr.) Gill. (7,62 %); *Armillaria mellea* (Vahl.) Pat. (5,60%) (fig.3).

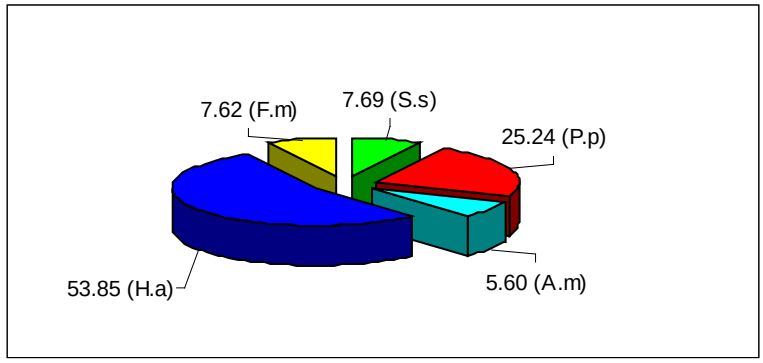

Fig. 3. The distribution of fungi on species: H.a (*Heterobasidion annosum*); P.p (*Phellinus pini*); S.s (*Stereum sanguinolentum*); F.m (*Fomes marginatus*); A.m (*Armillaria mellea*)

The programs of processing allowed the determination of some correlative relationships between the elements taken into consideration. Thus we had in view as input parameters: the medium altitude (m), the medium age of arboretums (years) and the medium distance between the trees (m) and as output elements, the percent of trees without dote (% s), the percent of trees with dote produced by the attack of other fungi (% a.c.) and the percent of trees with dote produced by the *Heterobasidion annosum* (% H.a) fungus.

The values of the correlation coefficients are presented in the table 1.

The values comprised in the table from above indicate certain tendencies of determining the relationships between the factors and the output parameters.

Table 1

The value levels of the correlation coefficients of the parameters of characterizing the attack of the lignicolous fungi

	Medium altitude	Age	Distance	% s	% a.c.	% H.a.
Medium altitude	1					
Age	0,450052	1				
Distance	0,912745	0,616832	1			
% s	-0,636633	-0,659986	-0,836874	1		
% a.c.	-0,242339	-0,48536	-0,07069	-0,226389	1	
% H.a.	0,487228	0,742788	0,38884	-0,149055	-0,929411	1

We have to remark the fact that these correlative relationships and analysis have been effectuated on trees with a high degree of damage regarding the great number of attacked trees. Consequently, the results are conclusive for this type of arboretum, the generalizations for other levels of damage could not be conclusive.

In these conditions the correlative relationship between the medium age and the proportion of healthy trees attracts our attention. The worsening of the health state, simultaneously with the age is obvious. The proportion of healthy trees becomes lower. The increased intensity of the relationship is remarked through the value of r = -0,6599, graphically represented in the figure 4.

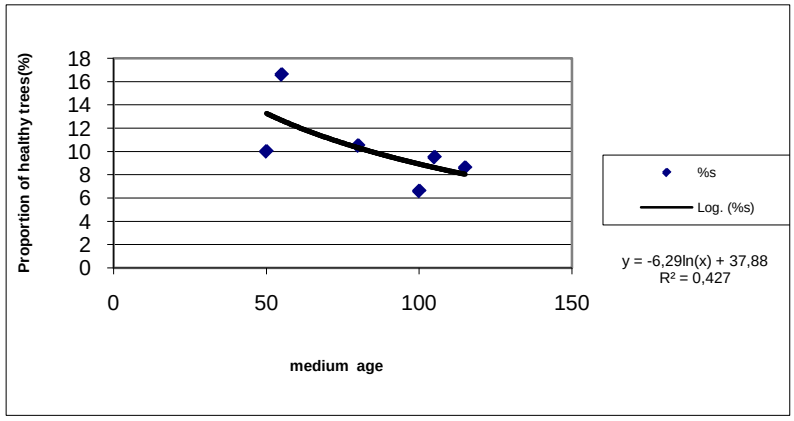

Fig. 4. The relationship between the medium age of the arboretum and the proportion of healthy trees

In this case, the compensation has been made through a curve of logarithmical type with a correlation coefficient of 0,6541, slightly under the value of the linear correlation. The evolution of the attack of lignicolous fungi in rapport with the medium age of the arboretum presents a special interest for the relationship host-parasite. By developing the tree population with the age the

proportion of attack of the trees increases too. In the figure 5 we present the relationship age – the proportion of the trees affected by *Heterobasidion annosum.* The intensity of the relationship is very high (r = 0,7814, R2 = 0,6106), for a curve of logarithmical type, which demonstrates the vulnerability of the old trees at the attack of the fungus.

Of the information analysed separately or correlatively, it results the fact that in the woods which present a high degree of affectation, by wounds of different origins, the dote is mainly produced by *Heterobasidion annosum* fungus.

As a consequence of analyzing the relationships from above we can say that in the degradation of the health state due to the age an important role is played by the lignicolous fungi.

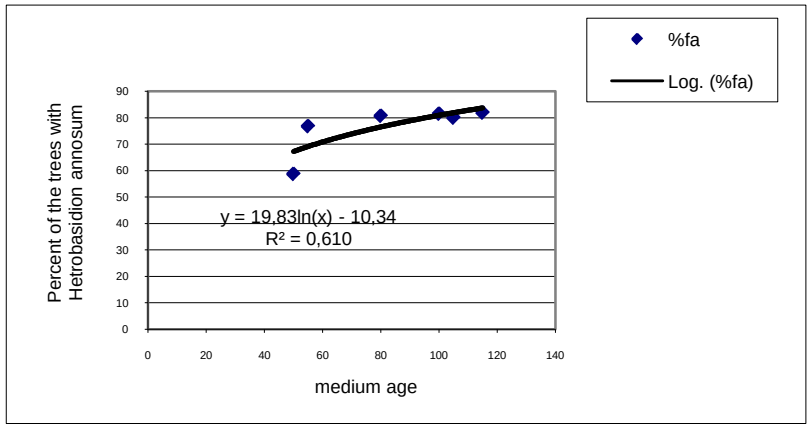

Fig. 5. The relationship between the medium age of the arboretum and the percent of the trees produced by the *Heterobasidion annosum* fungus.

The observation mat lead to the hypothesis according to which during the whole life cycle of a coniferous forest with a drastic percent of damage due to the wounds produced by animals or to the wounds of exploitation, the attack of the lignicolous fungi gets an increasing expansion, that's because it is very difficult to control.

The circumscription of all the ways of piercing these fungi becomes an element of great importance in the strategy of administrating this type of arboretum.

CONCLUSIONS

From the researches that have been effectuated results the fact that the coniferous forests from the department of Suceava, which present a high degree of affectation, by wounds of different origins, the dote can be produced by different species of lignicolous fungi, the highest percent reverts to the *Heterobasidion annosum* fungus.

The dominance of the *Heterobasidion annosum* fungus in the apparition of dote could be explained by the complexity and the instability of the enzymatic

equipment of which this fungus already disposes, which allows it to occupy a healthy substratum and also a substratum already colonized by other fungi, with the condition that this one be modified in its favor.

The results of this analysis cannot be generalized for all types of arboretums, because we proceeded to choose them from the point of view of the damage degree with the aim to evidence the destructive role of the lignicolous fungi installed on the wounded and debilitated trees, from a physiological point of view.

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