PLANTAINS (*PLANTAGO SP.*) POWDERY MILDEW (*PODOSPHAERA PLANTAGINIS)* ON WILD FLORA.

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Abstract. *Research aim of this research work was to determine the plantains dominant species from Nera river basin and their diseases. Also it is an attempt to see the spread of those diseases with specification that this is just a stage of research characteristic for partial interpretation of experimental data after the first experimental year, in preparation the doctoral thesis.*
Materials and methods. Observations were carried out in the summer of 2013. Those observations consist from two separate operations: first operation was to determine the areas with representative populations of Plantago sp., second to determin the species of these populations and third operation was to see if this plants are affected of some pathogens and forth operation was to evaluate the attack parameters of each pathogen. The novelty is relatively high, work providing important data for agricultural practice in the experimental area, taking in consideration the implications this are plants used for a relatively large scale for some pharmaceutical and cosmetic industry. From this point of view we appreciate that the plants from wild flora are considered to be sources for diseases resistance genes in the plant breeding process
Achievements stage in this field. In this work were carried out research concerning the possible reactions of the pathogens depending on local biocoenosis factors.
Limits of the research are that data from the research are just from one year readings. Practical implications of the research consisted of playing a part of a complex study of the diseases of medicinal plants from wild flora on the Nera river basin.
The originality of the work comes from the fact that data are relevant in view of mapping of the diseases of medicinal plants from wild flora which are considered to be genetic resources for breeding process. Importance of the paper became from bringing in front of the specialists a new topic concerning new and data, from observations of pathogens behavior in relation with plantains plants from wild flora.
Key words: *Plantago sp., wild flora, Podosphaera plantaginis*

INTRODUCTION

Ribworth plantains *(Plantago lanceolata)* is a medicinal plant found in different plant associations with reduced requirements to climate and soil. This explains why this species is quite common in the basin of the river Nera. During the evaluation of the health of plants from spontaneous flora including plantain plant, one of the pathogens which occure in all three populations evaluated on year 2013 was powdery mildew caused by the fungus *Podosphaera plantaginis* (DOCEA E., SEVERIN V., 1990). The fact that this fungus is a obligate parasite leads to a process of micro specialization and coevolution of the relationship between host plant and pathogen within limited local populations. This is because the ribworth plantain plants variability is quite small in the local populations(LAINE ANNA-LIISA, 2004).

On the other hand, the fungus *Podosphaera plantaginis* has in turn limited variability because it is an obligate parasite and the dissemination distance of anamorphic form is quite limited(YARWOOD, C.E., 1978). The variability is assumed to be lower in both case of the plants *Plantago lanceolata* and of the fungus *Podosphaera plantaginis* because the area of each population has many natural barriers created by the relatively troubled and fragmented landscape.

MATERIAL AND METHOD

During 2013 were conducted assessments of populations of ribworth plantains ((*Plantago lanceolata*) near villages Potoc, Slatina Nera and Sasca (both Romanian and Sasca Sasca Montana), all located in the middle basin of the river Nera. All three locations has typical vegetation meadows for the middle of the river Nera basin (CARMEN ELENA DANET, 2008). In each of these locations were made by 10 determinations on ribworth (*Plantago lanceolata*) plant density and assessed the attack frequency and intensity of powdery mildew (*Podosphaera plantaginis*).

A number of 10 determinations we considered sufficient because specialized literature data indicate that errors in various measurements applied to samples or measurements are below the limit of significance, if the number of samples or measurements is greater than 10 according to the literature (Elzinga C. L, et al, 1998). Locations where samples were carried out were relatively small in size, less than 2 hectares, which also led to the strengthening of the idea that the 10 determinations made diagonally are sufficient obtain relevant data and avoid errors. Based on the frequency and intensity of the fungus attack we calculated the degree of attack as synthetic index. Interpretation of results was done according to the methodology for single factor experiments, the only factor being ribworth plantain plants, and we use as control for data comparing, the average of the three populations.

RESULTS AND DISCUSSIONS

Evaluation of populations of meadows from middle Nera basin shows first that *Plantago lanceolata* is a constant presence in all plant associations of the sites surveyed, the overall average of the three populations was 4.9 plants / m^2 , with a variation on surveys between 2 plants / m^2 and 11 plants / m^2. Although not very large, this density allows an accurate assessment of the pathogens attack. The comparison between these three populations, point out that the highest density of *Plantago lanceolata* plants from 2013 was registered on Sasca population with 5.5 plants / m^2, a density lying in terms of statistically significant difference reported to control (mean density of three populations). The lowest density of plants was recorded at an average of only 4.4 plants / m^2 on Potoc population plants.

Frequency of attack of the fungus *Podosphaera plantaginis* to ribworth plantain plants from three populations ranged between 20% and 60% with an average of 36.8%. Compared to this average, the highest frequency of attack was registered in Slatina Nera population which, with an average of 41% was located in a statistically significant difference from the control. Sasca population recorded the lowest powdery mildew attack, even if the average of 34.5% of the 10 surveys were located in statistically below the limit of significance.

The intensity of attack indicator which shows the severity of affected plants of ribworth plantain, had a variation on all three populations between 10% and 50%, the average population is 26.2%, which is the witness used in comparing statistics of the three populations. Population recorded the highest value of attack intensity of the fungus *Podosphaera plantaginis* was Potoc population, whose average was at a significant difference from the control. The lowest attack intensity of pwderz mildew fungus was registered at Sasca population whose average intensity of attack of 25.5 % was at a negative significant difference from the control.

The attack degree, as the synthetic index of the frequency and intensity of attack, fully confirms the results obtained on the frequency and intensity of attack by the fungus *Podosphaera plantaginis* in the three populations of ribworth plantain (*Plantago lanceolata*) and their interpretation. The attack degree highest average of powdery mildew was registered at Slatina Nera with an average located at a significant difference from the control. The lowest

level of the fungus *Podosphaera plantaginis* attack degree was recorded at Sasca population, with an average which stood at a negative significant difference from the control.

Table 1

Ribworth plantains (*Plantago lanceolata)* population density in four locations of Nera river basin and plantains powdery mildew *(Podosphaera plantaginis)* attack parameters (frequency, intensity and attack degree) for the same surveys in 2013.

Survey	Ribworth plantains plants density (plants/m^2)				*Podosphaera plantaginis* attac frequency (%)				*Podosphaera plantaginis* attac intensity(%)				*Podosphaera plantaginis* attac degree			
	population of Sasca	population of Slatina Nera	population of Potoc	Average	population of Sasca	population of Slatina Nera	population of Potoc	Average	population of Sasca	population of Slatina Nera	population of Potoc	Average	population of Sasca	population of Slatina Nera	population of Potoc	Average
1	4	3	5	4,0	25	20	60	35,0	10	40	10	20,0	2,5	8	6	5,5
2	11	5	3	6,3	30	40	30	33,3	40	30	30	33,3	12	12	9	11,0
3	3	5	3	3,7	30	30	20	26,7	15	10	10	11,7	4,5	3	2	3,2
4	5	7	4	5,3	20	30	30	26,7	30	10	30	23,3	6	3	9	6,0
5	2	7	3	4,0	50	60	30	46,7	20	20	40	26,7	10	12	12	11,3
6	8	5	5	6,0	20	50	30	33,3	50	30	20	33,3	10	15	6	10,3
7	7	3	4	4,7	40	30	60	43,3	30	30	20	26,7	12	9	12	11,0
8	3	3	4	3,3	50	70	20	46,7	20	20	30	23,3	10	14	6	10,0
9	6	7	8	7,0	30	40	40	36,7	20	40	50	36,7	6	16	20	14,0
10	6	4	5	5,0	50	40	30	40,0	20	30	30	26,7	10	12	9	10,3
Average	5,5	4,9	4,4	4,9	34,5	41	35	36,8	25,5	26	27	26,2	8,3	10,4	9,1	9,3
Difference	0,6	0,0	-0,5	witness	-2,3	4,2	-1,8	witness	-0,7	-0,2	0,8	witness	-1,0	1,1	-0,2	witness
Signfic.	**	-	o	-	-	*	-	-	o	-	*		o	*	-	-
DL 5% = 0,4 DL 1% = 0,6 DL 0,1% = 1,1					DL 5% = 2,8 DL 1% = 5,3 DL 0,1% = 9,6				DL 5% = 0,5 DL 1% = 0,9 DL 0,1% = 1,6				DL 5% = 0,8 DL 1% = 1,4 DL 0,1% = 2,1			

CONCLUSIONS.

Populations of ribworth plantain (*Plantago lanceolata*) are well represented in the meadows from the middle basin of the river Nera, the average density of plants in all three populations was by 4.9 plants / m^2, the average number of plants of the three populations had a very small variation, even if the averages are statistically quite different.

In all surveys were ribworth plantain (*Plantago lanceolata*) plants affected by powdery mildew which shows the sensitivity of plants to the fungus *Podosphaera plantaginis*.

Attack degree of the fungus *Podosphaera plantaginis*, as synthetic indicator of the frequency and intensity of attack indicated that in 2013 most affected by powdery mildew were plants of Potoc population and were least affected plants of Sasca population, these differences in behavior of the plants is most likely due to the microenvironment of the populations locations.

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