PATHOGENE AND SAPROFITIC FUNGUS PRESENT IN THE MAIZE KERNELS SPERMOSPHERE, AS POTENTIAL PRODUCER OF MYCOTOXICOSIS ON MAN AND DOMESTIC ANIMALS

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Abstract: *Storing maize as cobs or directly as seed is one of the most important technological phases, both for agriculture and animal husbandry and food industry. Many of fungi and bacteria can be found on seeds when they are placed in silos but mostly in farmer's family granary, where the storage can be under the optimal technical level of control and ventilation could have as result a temperature and humidity increase in seed mass. This may lead to compromise of that stored seeds amount. On the other hand it should be noted that the microorganisms which can cause potential problems are placed in storage warehouses together with seeds because those seeds contain on the seminal skin or seeds inside those pathogens. Infections in this case have as point of origin directly from the field pathogens dissemination, or from indirect infections produced by transport or even handling the mass of seeds before storing. Maize biggest trouble can be caused by fungi of the genera Fusarium, Nigrospora, Aspergillus, Penicillium, and also Ustilagozeae. Even in small amounts some of these fungi spores when are placed in the good conditions of temperature and humidity for infection, will lead to the development of "molds" that emit dangerous mycotoxins such as aflatoxins, deoxynivalenol (DON or vomitoxin), fumonisin, trichothecenes, ohratoxins, citrinin, cyclopianozic acid, and sterigmatocystin. Or if the seeds are used to make concentrate forage for animal husbandry and this forage are kept in poor conditions, toxicosis caused by this fungi toxins are unavoidable and even products made from these animals are also toxic. In present paper we propose to show results of our research concerning the amount of potentially toxigenic fungi species in seed parties harvested in 2012, from several wheat varieties. Working method we used to determine the spores of these pathogens was extended Wageningen method with method of E. Rădulecu and A. Negru. Results clearly indicates the presence on the seeds coat of fungal spores from genera Aspergillus, Fusarium and Alternaria together f with Ustilagozeae which can cause trouble when using these seed farmers.*

Key words**:** *corn seeds, pathogens spores, Alternaria sp., Fusariumroseum, Ustilagozeae.*

INTRODUCTION

Such as countries with advanced agriculture, in Romania corn is used mainly as animal feed, from the form of silage and concentrated feed and finishing with recipes where corn come in different quantities. It also has many industrial uses corn (from the processing of the starch and to the alcohol industry) and even directly in the human food after it is processed into flour and oil. Taken in consideration these uses, especially in direct in food and forages, it is mandatory to keep a spotless health of maize seeds during storage period(1,4,8,9,10). The occurrence of any infection with fungi capable of producing mycotoxins is a threat to human health, either directly by entering corn in food or indirectly through the food cooked with meat from animals fed with forage containing mycotoxins, even in small quantities but this toxins can accumulate in the body(2,3,5,6).Therefore in this paper are presented results on the degree of infestation with spores of some species of fungi such as Fusariumroseum and Alternaria sp. corn can produce impairment if it does not comply with the conditions of storage. To all these

it can be added the fact that any enhancement of Ustilagozeae infestation level can lead mainly to dermatotoxicosis (11,14).

MATERIAL AND METHODS

The biological material used for this experiment consisted of seed samples from six of the most cultivated hybridson the Western Plain:Pioneer PR37Y12, Pioneer PR37F38, KWS 6471, KWS Krebs, Causade Conte andCausadePromi. Processing samples for detection and counting of the spores was carried out as follows: from the samples were randomly numbered 30 kernels in 3 repeats. The kernels were placed into 250 ml Erlenmeyer flasks in which they were washed with distilled water by stirring for 10 minutes. After washing, a seed were eliminated and from washing fluid was distributed in Eppendorf tubes and was centrifuged.After centrifugation, the liquid in the upper third of the tube was removed, the remainder being used for identification and enumeration of the spores of fungi that were originally on wheat kernels.Thus, this liquid was pipetted in cell counter room type Burker–Turk in order to have a standard of the liquid volume used to perform the spore count. Data resulted from counting spores were thesubject to statistical analysis, the results are in the present paper.

RESULTS AND DISCUSSIONS

The first thing that should be noted about all three pathogens by analyzing the results concerning the number of ofspores is that, even if there were repetitions of some hybrids the spores were absent, averages indicate the presence of the analyzed pathogens in all experimented hybrids. This shows that anz of this three pathogens can easily be transmitted by seed if it is not treated in accordance with good agricultural practice.

Results concerning the readings of *Ustilagomaydis* spores, as they areshown in table 1, it is clear that Causade Conte and Pioneer PR37F38 hybrids had the lowest number of spores, which in statistical terms stood at a negative significant differences compared to control. Conversely, the highest values of spores of Ustilagomaydis were recorded at hybrid KWS 6471 which registered a very significant difference from the control and at hybrid KWS Krebs which also registered a difference statistically assured as distinct significant to control

Tabel 1.

Results concerning the seeds contamination of some corn hybrids with spores of *Ustilagozeae*

Nr. crt.	Hybrid	Repetition 1	Repetition 2	Repetition 3	Average	Difference	Significance
1	Pioneer PR37Y12(380)	0	7	4	3,67	-0,44	0
2	Pioneer PR37F38 (450)	5	3	0	2,67	-1,44	00
3	KWS 6471 (360)	6	9	4	6,33	2,22	***
4	KWS Krebs (480)	3	8	5	5,33	1,22	**
5	Causade Conte (340)	1	0	6	2,33	-1,78	00
6	CausadePromi (460)	5	3	5	4,33	0,22	-
7	Average	3,33	5,00	4,00	4,11	Control	-

DL 5%= 0,3 DL1%= 1,1 DL 0,1 % = 1,9

Table 2 presents the results concerning the number of *Fusariumroseum*spores present

onseed mass of the six maize hybrids analyzed. It can be seen that the averages of the spore number were very similar at the analyzed hybrids which indicates a relatively uniform sensitivity of the genetic material from the hybrids to the attack of*Fusarium*roseum, analizing from statistical point of view, most of infected seeds by spores of the fungus *Fusariumroseum* were hybrids Causade Conte and KWS 6471, both of them recordsignificant differences compared with control. Hybrids whose seeds had registered statistically the lowest values of the number of conidia of Fusariumroseum were Pioneer PR37Y12 and CausadeProni hybrids values of condition number are located at negative significant differences compared to control.

Tabel 2.

Results concerning the seeds contamination of some corn hybrids with spores of *Fusariumroseum.*

Nr. crt.	Hybrid	R1	R2	R3	Average	Difference	Significance
1	Pioneer PR37Y12(380)	3,00	0,00	5,00	2,67	-1,06	0
2	Pioneer PR37F38 (450)	2,00	1,00	7,00	3,33	-0,39	-
3	KWS 6471 (360)	3,00	6,00	5,00	4,67	0,94	*
4	KWS Krebs (480)	4,00	6,00	2,00	4,00	0,28	-
5	Causade Conte (340)	1,00	5,00	8,00	4,67	0,94	*
6	CausadePromi (460)	7,00	0,00	2,00	3,00	-0,72	0
7	Average	3,33	3,00	4,83	3,72	Control	-

DL 5%= 0,4 DL1%= 1,2 DL 0,1 % = 2,4

Results concerning the number of fungus *Alteranria sp.* spores from maize seeds, shown in table 3, have shown that there are large differences between hybrids, whether those hybrids came from the same breeding company. Thus, if the hybrid KWS Krebs was registered an increasednumber of spores, data analysis point out that the difference is distinctly significant to control.In the same time, the number of spores of *Alternaria sp.* KWS 6471 has recorded a distinctly significant negative difference to control. Among other hybrids only Pioneer PR37Y12 andCausadePromiregistered some assured statistic.differences as significant negative values of the average number of spores of *Alternaria sp.*(table 3).

Tabel 3

Results concerning the seeds contamination of some corn hybrids with spores of *Alternaria sp.*

Nr. crt.	Hybrid	R1	R2	R3	Average	Difference	Significance
1	Pioneer PR37Y12(380)	2,00	3,00	3,00	2,67	-0,33	0
2	Pioneer PR37F38 (450)	1,00	5,00	3,00	3,00	0,00	-
3	KWS 6471 (360)	4,00	0,00	2,00	2,00	-1,00	00
4	KWS Krebs (480)	3,00	2,00	7,00	4,00	1,00	**
5	Causade Conte (340)	5,00	0,00	6,00	3,67	0,67	*
6	CausadePromi (460)	1,00	4,00	3,00	2,67	-0,33	0
7	Average	2,67	2,33	4,00	3,00	Control	-

DL 5%= 0,3 DL1%= 0,8 DL 0,1 % = 1,7

CONCLUSIONS

1. All hybrids tested had three pathogen spores indicating the presence of three phytopathogenic fungi in crops from where seeds came from.
2. Dynamic range of the number of Fusariumroseum conidia show some variability in resistance of the tested hybrids to this pathogen but their presence on all hybrids clearly show that in favorable years for this pathogen it can produce major attacks which translates directly by increasing the number of spores and micelles which subsequent lead to an increase quantities of mycotoxins in stored corn grains.
3. The increased presence phytopathogenic fungi *Alternaria sp.* and *Fusariumroseum* highlights the need to observe severe the storage conditions ant take all the measures this conditions to be strictly respected, because any mistake in this area could lead to the saprophytic development of at least these two fungi, resulting in a sharp depreciation of the quality of seed mass and massive presence of mycotoxins which means heavy losses for farmers.

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