RESEARCH ON MYCOFLORA PRESENT ON SOYBEAN SEEDS (*GLYCINE MAX* L.)

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Keywords: soybean, mycoflora, incidence.

ABSTRACT

The aim of this research was to identify the associated mycoflora and to determine their incidence on soybean seeds. Untreated seeds of the varieties Onix, Sigalia and Procera 1020 have been examined. The detected mycoflora has been represented by fungi from the genera: *Aspergillus* spp., *Rhizopus* spp., *Alternaria* spp., *Stemphylium* spp., *Fusarium* spp. The pathogen *Aspergillus* spp. had the highest incidence, of 44%, in the Procera 1020 variety, followed by the *Alternaria* spp. and *Stemphylium* spp. complex, with a 33% incidence, in the Onix variety. An attack of *Fusarium* spp. has been detected in the Onix variety.

INTRODUCTION

Soybean (*Glycine max* L.) is cultivated for the special characteristics of its seeds (Ash, 2010), being one of the oil plants with a high nutritional value (Hesseltine, 1985). In vegetation and seeds, soybeans are attacked by many diseases, which causes significant quantitative and qualitative crop losses. A healthy seed offers a good start for any crop and contributes to obtaining high yields in terms of quantity and quality (Raicu and Baciu, 1978). Knowing the health of seeds is a permanent concern, thus preventing the occurrence of massive infections in the field (Berca et al., 2015) with consequences on the yield of agricultural plants.

MATERIAL AND METHOD

The research aimed to identify the pathogens associated with mycoflora present on soybean seeds and determine their incidence. The biological material has been soybean seeds belonging to the varieties Onix, Sigalia and Procera 1020. The experiments have been placed in laboratory conditions, in three repetitions, using Petri dishes with a diameter of 60 mm. In each plate, on a layer with PDA culture medium (potato-dextrose-agar), three seeds of the analyzed varieties have been placed. The samples were incubated on a thermostat at 22°C. Observations have been made at 3, 6 and 9 days, following the growth and fruiting of pathogenic fungi. The identification has been made microscopically, by observations on the colonies and fructifications characteristic of the detected fungi, after 9 days of observation. The results have been expressed as the incidence of the species (%) of the total number of seeds of the analyzed variety.

RESULTS AND DISCUSSIONS

Pathogens were identified from cultures developed around soybeans

after 9 days of incubation (Fig. 1). The data in Table 1 show that the *Aspergillus* and *Alternaria* fungi species have been present in all analyzed varieties. Fungi of the genus *Stemphylium* have been detected on seeds belonging to the variety Procera, being detected in association with the *Alternaria* spp. fungi, which hasn't been observed in the case of the Onix variety. The specific pathogen fructification of *Rhizopus* spp. have been identified in the case of Sigalia variety, while in the Onix variety fungi of the genus *Fusarium* have been also detected.

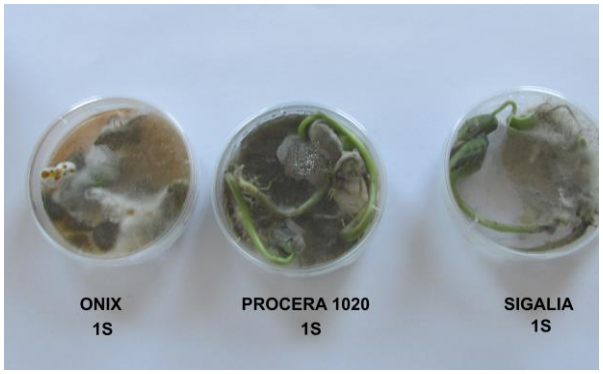

Figure 1. Mycoflora on soybean seeds (after 9 days) – from left to right: Onix, Procera 1020 and Sigalia

Table 1

Mycoflora detected on soybean seeds

The pathogenic agents	Variety		
	Procera 1020	Onix	Sigalia
Aspergillus spp	+	+	+
Alternaria spp	+	+	+
Stemphylium spp	+	-	-
Rhizopus spp	-	-	+
Fusarium spp	-	+	-

Regarding the incidence of the detected pathogens, the data from Table 2 show that the highest value of the incidence has been registered, in the case of *Aspergillus* fungi, in the Procera 1020 variety, of 44%, followed by the *Alternaria* spp. and *Stemphylium* spp. complex of 33% in the Onyx variety. Pathogens of the genus *Alternaria* and *Stemphylium*, in combination, had a 22% incidence in Procera 1020 and Sigalia varieties. The fungus of the genus Alternaria are cited as being present on soybean seeds (Broggi et al., 2007) and also in the mycoflora of agricultural plant seeds (Cristea and Berca, 2013; Cristea et al., 2008; Mardare et al., 2015, Manole and Cristea, 2015; Berca and Cristea, 2015). In the Sigalia variety, the pathogens *Aspergillus* spp. and *Rhizopus* spp., registered an incidence of 11%. The presence of *Fusarium* fungi has been noticed on the seeds of the Onix variety, common especially on cereal caryopsis (Dudoiu et al., 2016, Pana et al., 2014).

Table 2

The mycoflora incidence detected on soybean seeds

The pathogenic agents	Variety		
	Procera 1020	Onix	Sigalia
Aspergillus spp	44	22	11
Alternaria spp + *Stemphylium* spp.	22	33	22
Rhizopus spp	0	0	11
Fusarium spp	0	22	0

CONCLUSIONS

The seeds of the soybean varieties analyzed showed a spectrum of pathogens common to the seeds of agricultural crops: *Aspergillus* spp., *Alternaria* spp., *Stemphylium* spp., *Rhizopus* spp. and *Fusarium* spp. Fungus species of the *Aspergillus* and *Alternaria* genera have been identified in all monitored varieties. A high incidence was recorded for the Procera 1020 variety in the case of the *Aspergillus* spp. fungus, of 44%. The presence of *Fusarium* fungus fructification has been found only in the Onix variety, with an incidence value of 22%.

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