RESEARCHES ON THE MICOFLORA OF SUNFLOWER'S ACHENES FOR THE HYBRIDS CULTIVATED IN FETESTI AREA, IALOMITA COUNTY

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Abstract

Improperly called "seed" the sunflower achenes are an important mean of production but also of transmission of fungal diseases from this plant. The proper understanding of sunflower's achenes pathology has implications both in yield and in quality production. Researches made on the health of sunflower's "seeds" were carried out into "in vitro" conditions and aimed to identify some fungi that populate this plant's achenes. The biological material was consisted of sunflower achenes treated with Apron 3.3 l / t, coming from hybrids: PR63F73, LG 56.31CL, Tristan, NK Adagio, Clever, MS Oliva CL. The micromycetes' identification was achieved throw successive isolation and sub-culturing of them on the culture medium PDA (Potato Dextrose Agar) and incubated in the thermostat at 22^0C. They were identified pathogens like: *Alternaria* sp. - 65%, *Stemphyllium* sp. - 15%, *Aspergillus* sp. - 3%, *Rhizopus* sp. - 5%, *Penicillium* sp. - 2%. At Clever hybrid was identified the presence of *Fusarium* sp. micromycete and the *Aspergillus* sp attack was absent. Germination was 85% for the LC MS Oliva hybrid, 90% for Tristan hybrids and 95% for PR63 F73 and LG56.31CL hybrids. The seeds' germination was not affected at NK Adagio hybrid.

Key words: diseases, sunflower, *Alternaria*

The health of sunflower seeds has a particular importance for obtaining higher production in terms of quality and quantity (Raicu C., Baciu D., 1978).

The preservation and transmission of important pathogens of sunflower crop is done also through seed. Sunflower seeds mycloflora is associated with fungi like *Alternaria* sp. *Aspergillus* sp. *Fusarium* sp. *Rhizopus* sp. (Abdullah S.K., Al Mosawi K.a., 2010 Sharfun-Nahar, Mushtaq M., Hashmi M.H., 2005 Suryanarayanana T.S., Suryanarayanana S.S., 1990).

Also, *Alternaria helianthi* micomyceta is considered an important pathogen of the sunflower's seed (Udayashankar A.C., Nayaka s. Chandra, Archana B., Anjana G., Niranjana S.R., Mortensen C.N., Lund O.S., Prakash H.S., 2012). The seeds' treatment with different fungicides controlled the *Alternaria helianthi*'s attack (Jeffrey, K.K., Lipps, P.E., Herr, L. J., 1984).

MATERIAL AND METHOD

There have been studied sunflower hybrids coming from the ones cultivated in Fetesti, Ialomita County. The research aimed to identify the present pathogens on the sunflower achenes and their impact on germination.

The biological material was represented by the achenes from following sunflower hybrids: PR63F73, NK Adagio, Tristan, MS Olivia CL , Clever, LG 56.31CL. The achenes were treated with Apron in a dose of 3.3 l/to.

The sunflower achenes were placed in Petri dishes on PDA culture medium (potato-dextrose-agar) and incubated at thermostat at 22^0 C. In order to be identified, the pathogens were isolated and successively repicated on PDA culture medium and incubated under the same conditions. The culture medium was prepared after the classic recipe (Hulea A., 1969).

It had been determined the frequency of affected seeds by the identified micromycetes. The observations were performed at 3, 6 and 9 days. For the identification Zeiss Primo Star microscope was used. The determination of sunflower seeds' germination was performed on filter paper.

RESULTS AND DISCUSSIONS

The data in *table 1* show that the patogens species present on the sunflower's achenes belonged to *Alternaria* sp. *(figure 1, figure 2.*) *Stemphylium* (*figure 3*), *Penicillium*, *Rhizopus*, *Aspergillus* (*figure 4*), *Fusarium*. It was found that pathogens: *Alternaria* sp., *Stemphylium* sp. and *Rhizopus* sp. (*figure 5*) have populated the achenes of all the studied sunflower hybrids.

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The micromycetes belonging to *Penicillium* were identified at PR63F73, NK Adagio, MS OliviaCL, Clever hybrids. The *Aspergillus* fungi were present at the following sunflower achenes hybrids: PR63F73, NK Adagio, Tristan and *Fusarium* sp. (*figure 6*) was present only at Clever hybrid.

Table 1

The micoflora detected on sonflower's achenes

Hybrid	The pathogenic agent					
	Alternaria sp.	*Stemphylium* sp.	*Penicillium* sp.	*Rhizopus* sp.	*Aspergillus* sp.	*Fusarium* sp.
PR63F73	+	+	+	+	+	-
NK Adagio	+	+	-	+	+	-
Tristan	+	+	+	+	+	-
MS OliviaCL	+	+	+	+	+	-
Clever	+	+	-	+	-	+
LG 56.31CL	+	+	+	+	+	-

The detected observations on the micoflora's incidence are shown in table 2. Thus, it can be seen that *Alternaria* sp, present on the sunflower achenes from all the analyzed hybrids, had the highest values of frequency, from all the identified pathogens with high values at hybrids: MS Olivia CL (84%), followed by LG 56.31CL hybrid with 76%, NK Adagio with an incidence of 70% and Clever with 65%. The PR63F73 hybrid presented an incidence value of *Alternaria* below 50%.

The pathogens of *Stemphylium* type, presented the highest values of incidence for Tristan hybrid with 23%, Clever (20%) and PR63F73 with 19%. The smallest incidence was noted at MS OliviaCL hybrid (7%).

Rhizopus fungi, which were also presented on the achenes of the studied hybrids, showed the highest value incidence for PR63F73 hybrid with 13%, and the lowest value was recorded for the NK Adagio hybrid, with 2%. The incidence of *Rhizopus* sp. fungus was relatively close to other hybrids: 5% for Tristan and LG56.31 CL and 6% for Clever. For MS Olivia CL hybrid the incidence was 3%.

The *Penicillium* micromycetes were not presented for NK Adagio and Clever hybrids. The frequency of the fungus was 5% for Tristan hybrid, 2% for MS Olivia CL and LG 56.31CL hybrids and 3% for PR63F73. *Aspergillus* fungi were not presented at Clever hybrid and had a frequency of 6% for Tristan hybrid. The frequency values were close with 4%, 3% and 2% for PR63F73, NK Adagio, MS Olivia CL and LG 56.31CL hybrids. The *Fusarium* sp fungus was present with a lower incidence of 4% only for Clever hybrid.

Table 2

The micoflora's incidence detected on sunflower achenes

Hybrid	The pathogenic agent						Others (leeses) (after 9 days)
	Alternaria sp. (after 9 days)	*Stemphylium* sp. (after 9 days)	*Penicillium* sp. (after 9 days)	*Rhizopus* sp. (after 9 days)	*Aspergillus* sp. (after 9 days)	*Fusarium* sp. (after 9 days)	
PR63F73	45	19	3	13	4	0	16
NK Adagio	70	11	0	2	3	0	14
Tristan	55	23	5	5	6	0	6
MS Olivia CL	84	7	2	3	2	0	2
Clever	65	20	0	6	0	4	5
LG 56.31CL	76	15	2	5	2	0	0

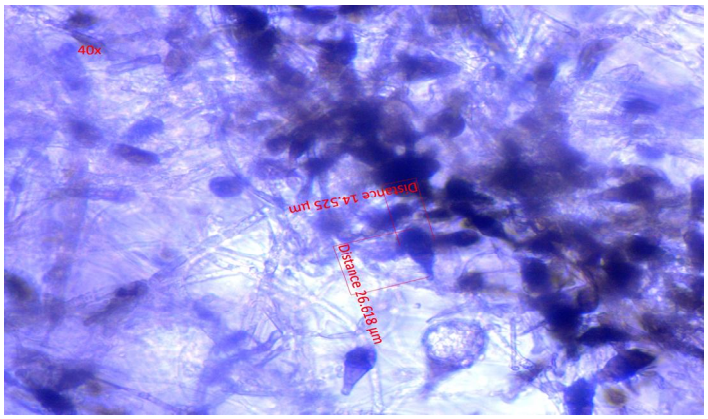

Figure 1 ***Alternaria*** **sp. - fructifications (MS Olivia CL)**

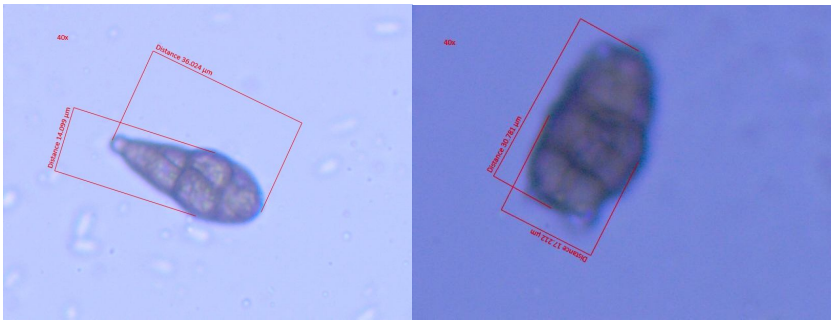

Figure 2 ***Alternaria*** **sp. - conidia (NK Adagio) Fig. 3.*Stemphylium* sp. – conidia (PR63f73)**

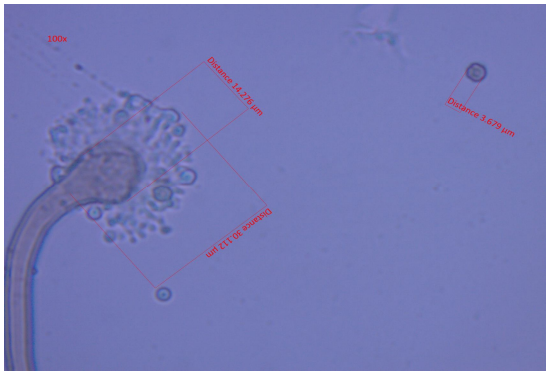

Figure 4 ***Aspergillus*** **sp. - fructifications (Tristan)**

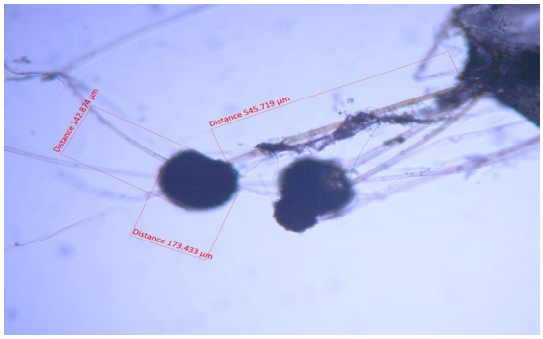

Figure 5 ***Rhizopus*** **sp. -- fructifications (MS Olivia CL)**

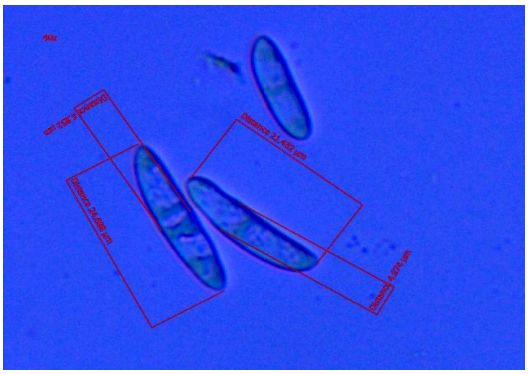

Figure 6 ***Fusarium* sp. – macroconidia (Clever)**

Table 3

Micoflora's influence on sunflower's germination

Hybrid	Germination (%)	
	after 4 days	after 7 days
PR63F73	95	95
NK Adagio	85	100
Tristan	80	90
MS OliviaCL	65	85
Clever	75	85
LG 56.31CL	95	95

The data in *table 3* shows that after 7 days of observation, sunflower seed germination was not affected for NK Adagio hybrid, also, with 95% for PR 6 3F 73 and LG 56.31CL. For Tristan hybrid the germination was of 90% and for MS Olivia CL and Clever hybrids the germination was of 85%. It was found out that for the sunflower seed germination on filter paper their colonization by the identified pathogens was reduced.

CONCLUSIONS

In accordance with the observations made, on the sunflowers' achenes micoflora, the following comments can be issued.

The seed's treatment allowed the development of fungi known for their development at the seed's level, and producion of molds.

The *Alternaria* sp., *Stemphlium* sp., *Rhizopus* sp fungus., have colonized all the sunflower's achenes in all the studied hybrids.

Higher frequency values were determined for the following hybrids: MS Olivia CLF = 84% and LG 56.31CL. The incidence values exceeded 50%, excepting PR63F73 hybrid, which had 45%.

Penicillium sp. and *Aspergillus* sp. pathogens, did not developed on the achenes of MS Olivia CL and Clever hybrids. The highest value was recorded at Tristan hybrid, with 6%.

The *Fusarium* sp fungal was identified only the achenes of Clever hybrid, with an incidence value of 4%.

The seeds' germination was not affected for NK Adagio hybrid. For MS Olivia CL and Clever hybrids the percentage of germinated seeds increased by 20% and 10% in the interval between the two readings.

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