THE MYCOFLORA OF BARLEY - THE VARIETIES EXTENSION CERTIFICATED AT ARDS - TELEORMAN

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Abstract

Knowing the health of the barley caryopsis holds an important place in this plant's pathology and help the establishment of its control measures, with major consequences in obtaining a high production in terms of quantity and quality. The researches on barley seeds micoflora were carried out in "in vitro" conditions and the biological material used was consisted of untreated barley caryopsis from several varieties: Andrei, Mareşal, Mădălin, Compact, Amical and Dana. The micromycetes' identification realised by successive isolation and sub-culturing on them in culture medium PDA (Potato Dextrose Agar). The pathogens were incubated in thermostat at a temperature of 22^0C. The identified micromycetes belonged to the next classes : *Alternaria* sp.- 45%, *Drechslera* sp.-31%, *Macrosporium* sp-10%, *Fusarium* sp.-5%, *Rhizopus* sp.- 4%, *Penicillium* sp.- 2%, *Aspergillu*s sp-3%. From the analyzed varieties the most affected were: Mareşal, Mădălin and Compact. The micoflora detected on the analyzed barley caryopsis did not inhibit their germination process.

Key words:

Barley is one of our country's most important grain and researches on the health of this plant represent a priority for obtaining high yields both in terms of efficiency and quality.

An important place in the research activity consists of the barley seed's pathology, which is an important mean in the transmission of dangerous pathogens for this culture. Researches on barley seed's pathology revealed that it shows major implications on production (Raicu C., Baciu D., 1978), and the seeds used for sowing must be free of parasites (Cana L., et al, 2010).

Barley seed-specific pathogens are responsible for significant crop losses, being taken into account along with the seed's treatment and the varieties' resistance (Arabi M.I.E., et al, 2004, Shahim S.A., et al, 2013; Castanares E., et al, 2013).

MATERIAL AND METHOD

Research aimed to identify the barley caryopsis' micoflora. The biological material was represented by barley caryopsis from the barley types, from 2013 harvest:Andrei, Mareşal, Mădălin, Compact, Amical and Dana grown in ARDS-Teleorman. Barley seeds were not treated previously.

In order to identify pathogenic species, the barley seeds were placed on PDA culture medium (potato - dextrose agar) prepared after the classic recipe (Hulea A., 1969), in Petri dishes, in three repetitions. The method consisted in the isolation and successive subculturing of the pathogens on the same culture medium and incubating them in thermostat at 22^0 C. The observations were made at 3, 6 and 9 days and the micromycetes' identification was done with Zeiss Primo Star microscope.

RESULTS AND DISCUSSIONS

The data in table 1 show that species of fungi belonging to *Alternaria* (*figure 1*) *Drechslera (figure 2*) and *Macrosporium* (*figure 3*) were present in the seeds of all analyzed varieties. *Fusarium* sp fungal *(figure 4)* was detected in the seeds of Andrei, Amical, Compact, Mădălin and Mareşal varieties, and was not presented in the seed of Dana variety. *Rhizopus* sp pathogen was found on the seeds of Compact and Mareşal varieties, and *Penicillium* sp. and *Aspergillus* sp. micromycetes on seed varieties from Dana, Amical, Mădălin and Mareşal. Dana and Andrei seed varieties had the lowest fungal load.

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Table 1

Micoflora detected on barley seeds

Variety	The pathogenic agent						
	Alternaria sp.	*Drechslera* sp.	*Macrosporium* sp.	*Fusarium* sp.	*Rhizopus* sp.	*Penicillium* sp.	*Aspergillus* sp.
Andrei	+	+	+	+	-	-	+
Amical	+	+	+	+	-	-	+
Compact	+	+	+	+	+	-	-
Dana	+	+	+	-	-	+	-
Mădălin	+	+	+	+	-	+	-
Mareşal	+	+	+	+	+	-	+

Regarding the incidence of the identified micromycetes attack in table 2 it is observed that the highest values were registered at Maresal variety with 51%, Compact and Mădălin with 47% and 46%, and the lowest value was found at Dana variety with 38%.

The frequency of *Drechslera* sp. fungus had values of about 31%, with lower values for Dana Variety, 23% and Andrei with 26%. The highest incidence value of *Drechslera* sp. was observed at the seeds coming form Mădălin variety. The *Macrosporium s*p. fungus was related to *Alternaria* sp micromyceta with values between 7% for Andrei and Dana varieties and 12% and 14% for Amical and Compact varieties.

The attack of *Fusarium* sp. was not observed on the seeds of Dana variety, and had an incidence of 8% for Mareşal and 7% for Amical. For Andrei variety the *Fusarium* sp's incidence was of 3%. It had been noticed that *Rhizopus* sp., *Penicillium* sp. and *Aspergillus* sp. were observed with reduced frequency values and only for Compact, Mădălin, Amical and Mareşal varieties, with values of 4% *Rhizopus* sp. on the seeds of Compact, 6% - *Penicillium* sp. on the seeds of Mădălin si 6% - *Aspergillus* sp. on the seeds of Mareşal.

Table 2

The micoflora incidence detected on barley's seeds (after 9 days)

Variety	The pathogenic agent						
	Alternaria sp.	*Drechslera* sp.	*Macrosporium* sp.	*Fusarium* sp.	*Rhizopus* sp.	*Penicillium* sp.	*Aspergillus* sp.
Andrei	42	26	7	3	0	0	0
Amical	45	32	12	7	0	0	4
Compact	47	33	14	4	4	3	0
Dana	38	23	7	0	0	0	0
Mădălin	46	35	10	6	0	6	5
Mareşal	51	34	9	8	3	0	6

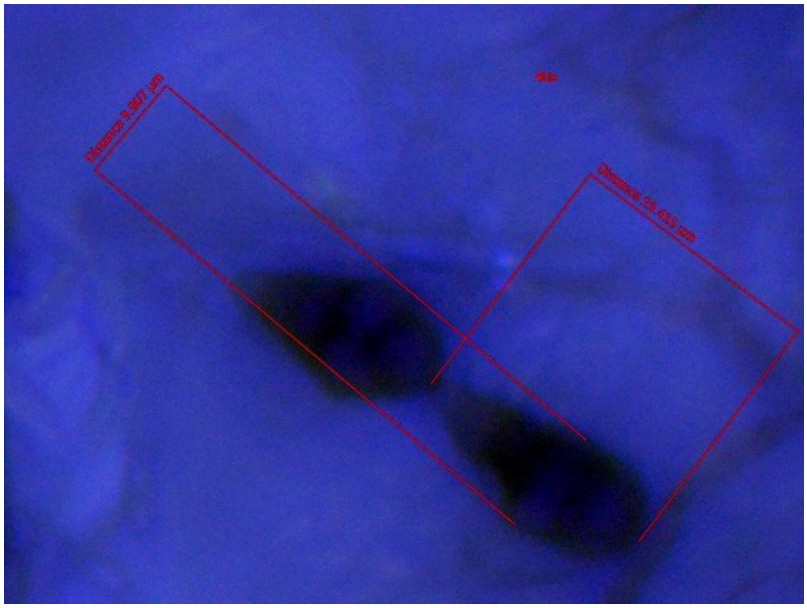

Figure 1 ***Alternaria* sp. – fructifications (Amical variety)**

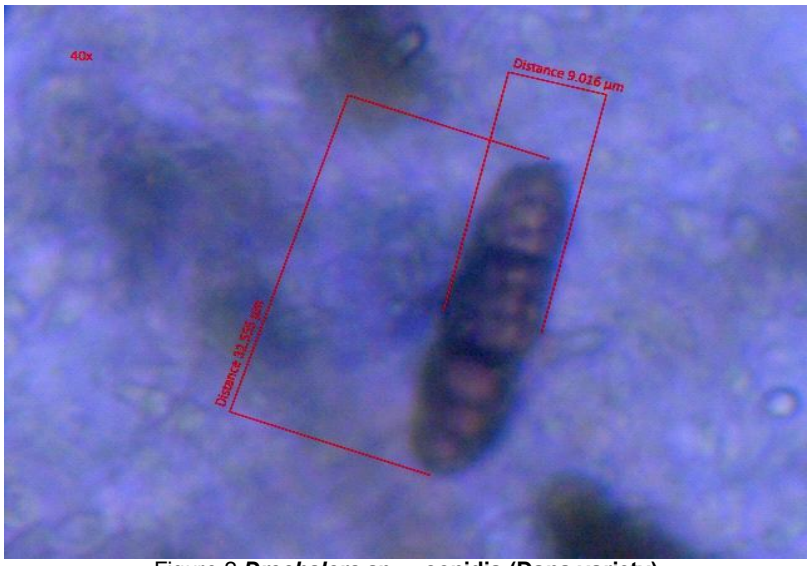

Figure 2 ***Drechslera*** **sp. – conidia (Dana variety)**

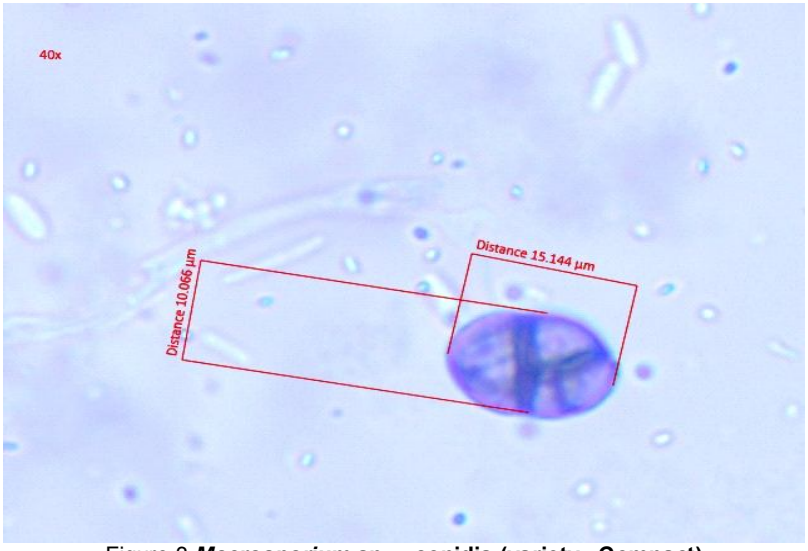

Figure 3 ***Macrosporium*** **sp. – conidia (variety Compact)**

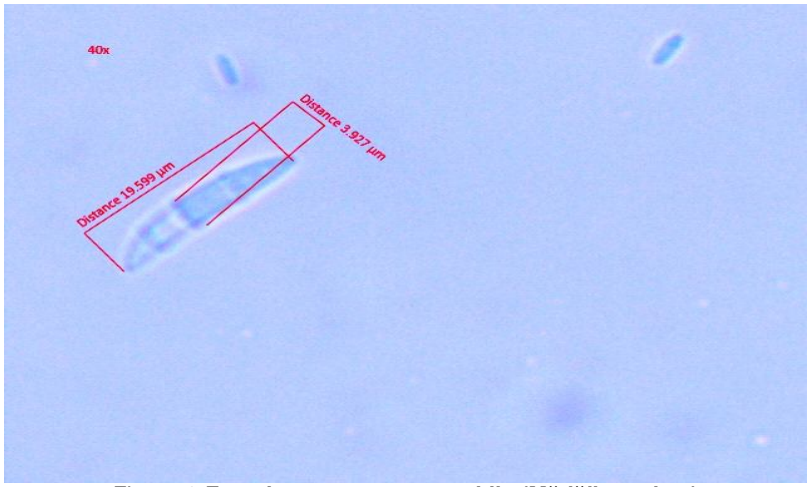

Figure 4 ***Fusarium*** **sp. – macroconidia (Mădălin variety)**

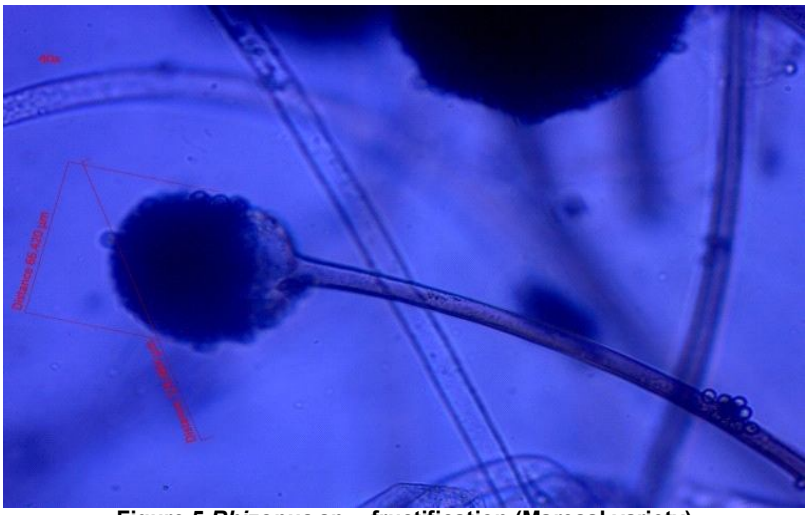

Figure 5 *Rhizopus* sp. - fructification (Mareşal variety)

CONCLUSIONS

The observations made in the laboratory conditions led to the following conclusions:

Barley seeds micoflora was associated with its specific pathogens, fungi *Drechslera*. and *Fusarium* varieties, but also with recognized pathogens that populate generally plants and seeds and that lead to their deterioration, as *Penicillium* sp., *Aspergillus* sp. and *Rhizopus* sp., *Alternaria* sp.

The micromycets of *Drechslera* variety were identified on the analyzed seeds with a higher frequency at Mădălin variety, where the value was 35%.

The fungi of *Alternaria* variety presented the highest incidence, with higher values at Mareşal variety, 1% and Compact with 47%.

Mareşal, Mădălin and Compact varieties had the most diverse pathogen load and for Dana and Andrei varieties was registered the poorest pathogenic micoflora on the seeds.

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