

# MICROMYCETES PRESENT ON CEREAL SEEDS FROM STORAGE AND THEIR EFFECT ON QUALITY DECREASE OF THE PRODUCTS

## MICROMICETE PREZENTE PE SEMINTELE DE CEREALE DEPOZITATE SI EFECTUL LOR IN DIMINUAREA CALITATII PRODUSELOR

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**Abstract.** *The degradation of agricultural products after the harvest is provoked by numerous factors that influence the growth and development of the deposit micromycetes. It is very well known that, because of the high degree of products humidity, of the high atmospheric temperature, the lack of aeration during the depositing and the presence of harmful substances, favorable conditions for the growth and development of saprophyte microorganisms that alter the quality until the accentuated degradation of seeds are created.*

*Since, in our country, the number of deposits with controlled atmospheric conditions is reduced, the producers are confronted today with great problems regarding the deposit of seeds. The great number of saprophyte fungi met on the deposited seeds, make them suffer from qualitative depreciations.*

**Rezumat.** *Degradarea produselor agricole dupa recoltare este provocata de numerosi factori care influenteaza cresterea si dezvoltarea micromicetelor de depozit. Este bine cunoscut faptul ca din cauza gradului ridicat de umiditate a produselor, a temperaturii atmosferice ridicate, lipsa aeratiei in timpul depozitarii si prezenta daunatorilor, se creaza conditii favorabile pentru cresterea si dezvoltatea microorganismelor saprofite care altereaza calitatea pana la degradarea accentuata a semintelor.*

*Deoarece, la noi in tara, numarul depozitelor cu conditii atmosferice controlate este redus, producatorii se confrunta astazi cu mari probleme legate de depozitarea semintelor. Numarul mare de ciuperci saprofite intalnite pe semintele depozitate, fac ca acestea sa sufere depreciari calitative.*

In the last years, the farmers are confronted with great problems issued by the degree of attack of these microorganisms. Because of the fact that through the evolution of these pathogen agents, the commercial value of the cereal products decreased, the agricultural producers lost a lot from this phenomenon, and great quantities of degraded product could not be used not even for the food of animals, because of the enzymes and toxins eliminated by these fungi.

It is very important to know the fact that the corn kept at a beans humidity higher than 14%, and at a temperature higher than 2-3°C, inevitably leads to major depreciations, otherwise the wheat caryopsis deposited with a humidity higher than 16-18% and a relative humidity of the air over 80%, determines the qualitative decrease of products, especially if they were deposited without a previous aeration.

## MATERIAL AND METHOD

In order to identify the saprophyte microorganisms from the cereals, we studied the seeds from the household deposits, represented by stores and bins, in which the cereals, especially the wheat (*Triticum aestivum*) and corn (*Zea mays*), were deposited, for a period of one and respectively two years.

The all-level samples were assayed from the quantity of deposited products and were brought to the laboratory for carrying out specific phytopathological and mycological analyses, in view of establishing with exactitude the number and the species of micromycetes present on the seeds of deposited cereals.

The analysis of samples was carried out by putting the caryopses in Petri recipients with PDA nutritive medium and medium with Malt extract and then followed by their incubation at a temperature of 22<sup>0</sup>C, for determining the increase and development of the existent mycoflora.

## RESULTS AND DISCUSSIONS

Beginning with the moment of the introduction in the deposits, the products were subject to the danger of rodents, insects and mites, to a series of saprophyte fungi, and also to the danger of some bacteria. The saprophyte fungi met on the deposited cereals whose evolution depreciates their quality, are cited in the specialty literature, by several researchers. These micromycetes are:

- *Alternaria tenuis*, Ness;
- *Cladosporium herbarium* (Pers.)Link.;
- *Chaetomium sp.*;
- *Epicoccum purpurascens*, Ehren;
- *Trichoderma viride*, v. Teigh;
- *Acremoniella atra* (Corda) Sach;
- *Trichotecium roseum* (Pers) Link;
- *Aspergillus sp.*;
- *Rhizopus sp.*;
- *Mucor sp.*;
- *Stachybotrys atra*. Corda;
- *Stemphylium graminis* (Corda)Bonord;
- *Papulaspora sp.*;
- *Curvularia lunata*. (Walker) Boedijin.
- *Drechslera sp.*

After the mycological and phytopathologic analyses made in the laboratory, we ascertained the presence of saprophyte fungi of the type:

- *Fusarium sp.*, that was emphasized in all the analyzed samples, under the form of a white and pink mycelium; in a rather high proportion, but especially on the wheat sample for a period of two years, (fig. 9).

- The genera of the species *Penicillium*, were developed in a high proportion on all the analyzed samples, and especially on the wheat seeds on a Malt nutritive medium, (fig. 5).

- *Alternaria sp.*, was identified in all the samples, and the average proportion was of 45%, (fig. 2).

- *Rhizopus sp.* Was present in all the analysis samples, beginning even from the first day if incubation, unlike the fungi in the *Mucor* genus, which were encountered on the samples in a smaller percentage

- *Cladosporium herbarum* (Pers.) Link; was present only in the samples with nutritive medium of malt extract, (fig. 3 and 7).

- *Stemphylium graminis* (Corda) Bonord, the percentage of this fungus in the analyzed samples was reduced, being encountered only wheat caryopsis two years storages. (fig. 8).

- *Drechslera* – found on the wheat samples, in a higher proportion on the caryopses found on malt-agar nutritive medium, than on those situated on PDA medium. (fig. 4).

- *Rhizoctomia*- a rather rare species encountered on the cereal caryopses, but in our samples it was identified in a smaller proportion but only on the mediums with malt extract. (fig. 6).

The psychopathological and mycological analysis permitted us to identified micromycetes species which picture could be seen bellow:



Fig.1 - *Aspergillus sp*



Fig.2 - *Alternaria alternata*

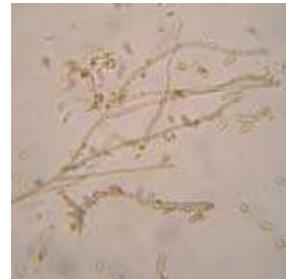


Fig.3 - *Cladosporium*



Fig.4 - *Drechslera sp*

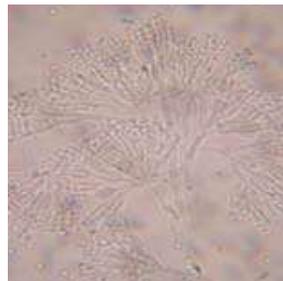


Fig.5 - *Penicillium*



Fig.6 - *Rhizoctonia*

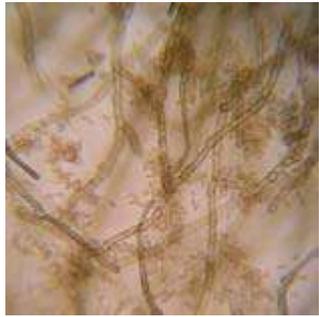


Fig.7 - *Cladosporium* și  
*Rhizoctonia*



Fig.8 - *Stemphylium*  
*graminis*

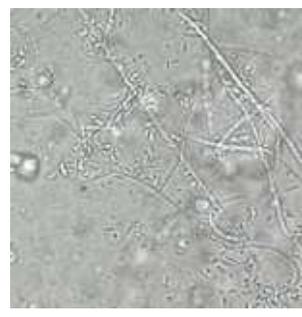


Fig.9 - *Fusarium* sp

## CONCLUSIONS

From the performed analysis, the following conclusions occur:

- Among the saprophytic micromycetaes, which are likely to grow on deposited wheat caryopsis, no matter of storing conditions and all-level samples, just a few appeared.

From the 15 types mentioned by the researchers in the past, only 10 types are met in our samples.

- There were identified 7 types of fungi on wheat samples with storing periods of 1 year and 2 years, respectively; among those only *Drechslera* type is pathogenic and the rest of them are saprophytic micromycetaes which lowers the quality of the wheat.

- Species of *Fusarium* sp., *Penicillium* sp. and *Rhizoctonia* sp. types were found in the samples although there are rarely mentioned in the specialty literature

-Species of *Penicillium* sp., *Aspergillus* sp. and *Fusarium* sp types are funguses which produce damaging mycotoxines for humans and animals, so optimum storing conditions must be created in order to prevent the growing and developing of such micromycetaes.

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