

RESEARCH ARTICLE

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Determination of mycoflora in the rye cobSABRI HAJDINI¹, DONIKA PRIFTI²¹P U M, Faculty of Food Technology, Mitrovica²University of Tirana, Faculty of Natural Sciences, Department of Industrial Chemistry**Abstract**

The aim of this study is to determine the expansion of mycoflora on the rye before harvest and in storage conditions. Environmental temperatures at the time of sampling in rye field (pre-harvest) were 32°C. Determining method was pouring cultivation (veiling) of limit dilutions in Petri plates of 9 cm diameter in two nutritional grounds: Czapek and PDA. After insemination and incubation at temperature of 28°C in which conducted isolation of moss with greater expansion frequency. The next step was to identify them based on cultural characteristics (phenotypic) and their microscopic appearance by preparing respective preparation. From this study we found out that the in a higher percentage dominates the mold of class *Fungi imperfecti*-gender *Fusarium* and *Alternaria* and less those of the class *Ascomycetes* - gender *Aspergillus* and *Penicillium*.

Key words: *mycoflora*, *rye*, *contamination*

1. Introduction

Rye - *Secale Cereale* is part of the *Graminaceae* family and winter cereals group – *microterme*, which develop in a temperature from 0 up to 15°C, in the regions with mild summer and strong winter. An important characteristic of the rye is that it grows in poor fields and in those with cold climate, and thus it is cultivated in mountainous places [10]. Rye as other cereals serves as food for human beings and animals. For bread preparation rye flour is mixed with wheat flour in order to improve the nutritious value and taste. In favorable environmental conditions, the rye product is comparable with wheat, whereas in unfavorable environmental conditions it exceeds wheat products.

In figure 1 we have presented the color of rye cob affected by mycoflora: a dark color in olive-green and black rash which give a bad view of the cob. The touch of rye cob from mycoflora has a negative influence in production.

Mycoflora usually accompany the rye in the field and also in their storage. The number of those microorganisms for a gram of cereal reaches millions and has a great importance in the quality and their storage [7]. In normal and healthy cereals the most dominant mycoflora is *mycelium sub epidermal*, which is present in the regions with humidity, where exponent is the mycoflora of gender *Alternaria* [10].



Figure 1. Rye cob affected by mycoflora

2. Material and methods

The analysed mycoflora have been taken from different regions of the country, from stored rye for a year.

The determination method was the one of agar plate. This method is indirect because the acquired results are evidenced after the closure of sowing and incubation of champions [7].

For analysis we have taken 10 g of rye from which we have prepared dilution limits (in total three dilutions) from which we have sown up to 1 ml. in three parallel plates Czapek and PDA. This method is based in the possibility of cell microbial migration from the surface of rye grain in the water environment [8].

The plates then are placed in thermostat in a temperature 28°C and after incubation of 7 days; the mycoflora is isolated in a higher frequency of

distribution and placed in a steep terrain Czapek and PDA. After development of isolated mycoflora, in a thermostat of 28°C we proceeded with the planting of mycoflora in Petri plates for giant colonies for determination of phenotypic characteristics and their identification [5, 6, 9].

We also prepared preparations for microscope monitoring.

3. Results and discussion

Isolated mycoflora from rye samples

From isolated mycoflora from rye samples the most common ones are those of *Fungi imperfecti* class and usually those of *Fusarium* and *Alternaria* gender; and in rare occasions were those of *Ascomycetes* classes. Mycoflora of *Fusarium* and *Alternaria* gender were distributed in all samples, 47,61% and 26,19% respectively. This range of distribution is presented in Figure 2. When the studied samples are compared it is found that there are no differences in the distribution of those mycoflora which are isolated. Other authors have expressed another broader range of distribution of those mushrooms that infect the rye. In figure 3 is presented the content of mycoflora of *Fungi imperfecti* class compared with *Ascomycetes*.

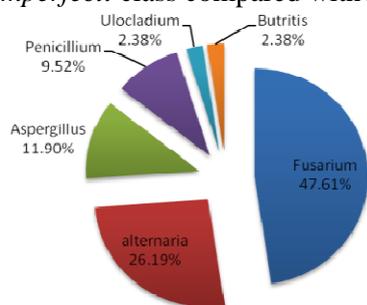


Figure 2. Average spread of mycoflora in the sample of rye



Figure 3. Comparison of mycoflora of *Ascomycetes* and *Fungi* isolated from rye

Mycoflora of *Fungi imperfecti* class, which affect in general the cereals during their vegetation, are also known as *field mycoflora*; whereas mycoflora of *Ascomycetes* class usually that affect the cereals during their storagere are known as *storage*

mycoflora. The results taken from this study, are a good way to prove this occurrence.

From comparison of mycoflora contents in samples taken in the last two years- during the winter of 2011 and 2012 with samples taken in the summer of 2013 it is found a reduction of mycolora and especially: *Alternaria*, *Aspergillus*, *Botrytis*, *Cladosporium*, *Penicillium*, *Fusarium*, *Trichoderma*, *Ulocladium*. However, there are not important statistical differences between the samples taken in different places and regions.

Some of the isolated mycoflora, giant colonies and their microscopic preparations are presented in figure 4-9.

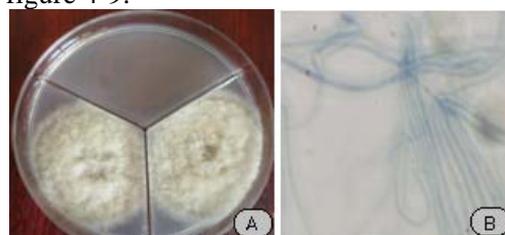


Figure 4. *Fusarium* spp. 7 days colony in Czapek terrain



Figure 5. *Alternaria* spp. 7 days colony in Czapek terrain

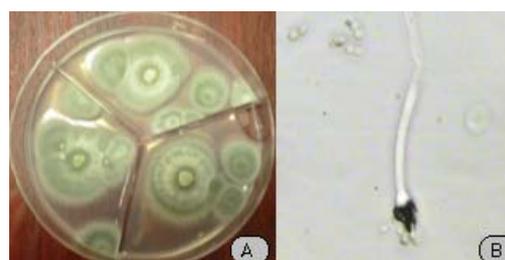


Figure 6. *Aspergillus glaucus*. 7 days colony in Czapek terrain

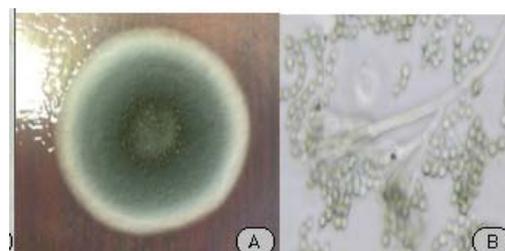


Figure 7. *Penicillium cyclopium*. 7 days colon in Czapek terrain

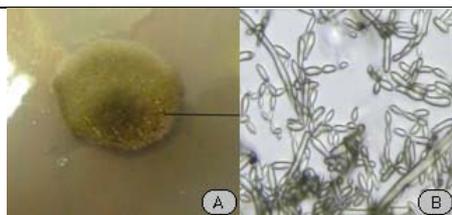


Figure 8. *Cladosporium* spp. 7 days colony in Czapek terrain



Figure 9. *Botrytis* 7 days colony in Czapek terrain

5. Conclusions and recommendations

From this study, which is of its first kind in Kosovo, we conclude the following:

- Rye infection from mycoflora during the summer of 2013 has been of a lower intensity due to higher temperatures, lower humidity, and unfavorable conditions for rye development.
- The content of rye in samples of rye was not very high in general.
- The infection from rye can be caused not only in the field, but also during the rye processing and especially during grind of storage.
- The increase of humidity during these processes causes fast development of mycoflora.
- In order to prevent the development of mycoflora in rye during the processing, we must lower the content of humidity in the processed rye in the animals' food, and also during the preparation of flour.
- We also recommend that this study to be continued for the coming years

6. References

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