Filamentous fungi variation in the soils from grasslands populated with *A. Capilarris* l from Banat`s Mountains

1Borozan Aurica Breica, 2Dogaru Diana, 2Bordean Despina Maria, 2Moldovan Camelia, 3Sandoiu I., 2Dumbrava Delia

1Banat`s University of Agricultural Sciences and Veterinary Medicine, “King Michael I of Romania” ,Faculty of Horticulture, Calea Aradului no. 119, RO- 300645, Timisoara, Romania; 2Banat`s University of Agricultural Sciences and Veterinary Medicine, “King Michael I of Romania” ,Faculty of Food Technology, Calea Aradului no. 119, RO- 300645, Timisoara, Romania; 3Banat`s University of Agricultural Sciences and Veterinary Medicine, “King Michael I of Romania” ,Faculty of Agriculture, Calea Aradului no. 119, RO- 300645, Timisoara, Romania

*Corresponding authors: diana25_dv@yahoo.com, ionut_sandoiu@yahoo.com

Abstract

The diversity of soil microorganisms is influenced on the one hand by the relations between plants roots and soil microorganisms in rhizosphere. This study tracks the influence of *A. capilarris* L, besides humidity and heights on filamentous fungi. In order to isolate this microbial group were taken soil samples from 14 different places from Banat`s Mountains (Anina Mountains, Almaj Mountains and Semenic Mountains, all from Western Carpathians). All samples were taken in autumn. The samples were prepared in laboratory. For filamentous fungi study was applied the method of soils grains and then fungal genders were put on Czapek medium and studied macroscopic and microscopic. There was observed that fungal diversity is generally reduced. Fungal biomass could be influenced by humidity. Population degree of soil grains depends of heights.

Material and Methods

Soil samples were taken in autumn, from permanent grasslands from Banat`s Mountains. (Anina Mountains, Almaj Mountains and Semenic Mountains), (figure 1). Banat`s Mountains southern group, where are situated the three mountains mentioned, that contain the 14th studied locations are composed of crystalline schists, limestones and volcanic rocks. Generally, the heights are medium, under 1.000 m. The highest peak in Semenic Mountains is 1445m and Almaj Mountains is 1228m. the climate of Banat`s Mountains is influenced by submediterranean climate [23].
The samples were taken at different highests, from rhizosphere of *A. capilarris* specie. This is dominant in grasslands that interest us. The samples were prepared in laboratory. For filamentous fungi study was applied in initial phase the method of soils grains, in 5 repetitions [20], followed by fungal gender isolation on a specific medium (Czapek) in 2 repetitions. In the method of soil grains was established the degree of population filamentous fungi and actinomycetes. On Czapek medium were made quantitative and qualitative determinations. Optimal temperature for this microbial group development was 28°C and incubation time was 6 days.

**The main location of harvesting were**

1. Zlatita
2. Oravita
3. Anina
4. Valiug
5. Bigar
6. Cuptoare
7. Garana
8. Semenic Piatra Goznei
9. Semenic Station
10. Barbosu
11. Eftimie Murgu
12. Valea Pai
13. Carasova
14. Carasova livada
Results and Discussions

On the observation made were taken some conclusions, showed in figures 1 and 2. After methods applied, was observed that the most populated grains from soil with microorganisms were from places: Or, An, Bi, Ga, Ef M, VaP and CaL (figure 2).

![Fig.2. Fingerprint of studied parameters](image)

**Legend:** Zlatita (Zi), Oravita (Or), Anina (An), Valiug (Va), Bigar (Bi), Cuptoare (Cu), Garana (Ga), Semenic Piatra Goznei (SeP), Semenic Station (SeSt), Barbosu (Ba), Eftimie Murgu (Ef M), Valea Pai (VaP), Carasova (Ca), Carasova livada (CaL); R1-5-repetition; CFU g⁻¹ g soil after 6 days of incubation

Besides filamentous fungi were develop actinimicaetae too. The smallest amount of filamentous fungi population was on soil grains from Cu and Ba. Filamentous fungi were influenced by highest [14]. If we put the location of samples harvest function to decreasing degree of biomass we have the following scheme: Bi>Ba>Zi>VaP>EfM>CaL>Or>Cu (figure 1). At this increasing a big contribution is made by soil humidity [5], kind of soil [15], and kind of plant [11].

The development of plant is influenced by soil nutritive resources and their disponibility is bond by soil reaction. Plants root system has a selectice action on microflora from the zone of influence [18]. The processes from rhizosphere are controlled by influences between plants roots, microflora and animals [6]. The season of soil samples prelevation could have a benefic effect on a microbial group.
Cluster analysis shows 3 main clusters which group locations based on CFU x (10^4)/g soil and soil moisture content (figure 2). The applied Cluster analysis is based on Paired Group Algorithm, using correlation as similarity measure (the complement “1-r” of Pearson’s “r” correlation), (figure 2).

The cluster analysis of the data was performed using PAST version 2.14 [5a]. From fungal gender from soil there are: Aspergillus, Humicola, Acremonium, Monosporum si Penicillium. A bigger variation of these gender was in Se location.

**Conclusion**

The highest degree of microbial population was in soil grains samples from locations at reduced highest (Or, An, Bi, Ga, Ef M, VaP si CaL). Filamentous fungi are dominated in soil samples from Bi location where soil humidity was rather high. The diversity of fungal gender was reduced. The highest number of microbial gender was in soil samples from Se location.

**References**


