ANTIOXIDANT CAPACITY OF THE EXTTHE *ACTINOBACTERIA* MICROBIAL COMMUNITY STRUCTURE IN A TYPICAL CHERNOZEM SOIL

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CZU:579.64:631.461 https://doi.org/10.52757/imb22.10

Actinobacteria, the biotechnologically valuable bacteria, are the dominant class of the *Bacteria* domain in most soils. Approximately 45% of all discovered bioactive microbial metabolites are produced by *Actinobacteria*.

The aim of the research was to study the community structure of *Actinobacteria* class from a typical chernozem. The research was carried out in the long-term field experiment of the "*Biotron*" Experimental Station of the Academy of Sciences of Moldova in two crop rotations (with and without alfalfa). Characterization of the compositional diversity of the soil microbiome was achieved by the 16S rRNA amplicon sequencing (Scientific Center "Genomic Technologies, Proteomics and Cell Biology" of FSBSI ARRIAM, St. Petersburg, Russia).

The results of the investigations demonstrated that *Actinobacteria* had the highest relative abundance (8.2%) compared to 3 other classes (*Thermoleophilia*, *Rubrobacteria*, *Acidimicrobiia*) of the phylum *Actinobacteriota*, identified in the soil of the the long-term field experiment of the "*Biotron*" Experimental Station (Chişinău). *Actinobacteria* had the highest relative abundance in the *Mineral fertilization* and *Control* variants of both crop rotations, and the lowest abundance was in the *Organic fertilization* (postaction) variant. The cla*ss* was represented by 10 orders of bacteria. The orders *Propionibacteriales (2.5%), Micrococcales* (2.3%) and *Frankiales* – (1.2%) had the highest relative abundance. The order *Propionibacteriales* was more abundant in the variants with mineral fertilization of the both crop rotations, and in the soil of the forest shelterbelt, the order *Micrococcales* - in the variants *Control* and *Forest shelterbelt*, the order *Frankiale*s - in the variants *Control* of the both crop rotations, and *Mineral fertilization* of the crop rotation without alfalfa. The rarer orders with abundance ≤ 0.1 were *Corynebacteriales, Kineosporiales*, *Streptosporangiales*. The maximum abundance of these rare orders was observed in the following variants: *Corynebacteria*les - in the *Forest shelterbelt*, *Kineosporiales* - in *Control* of the both crop rotations, and *Streptosporangiales* - in *Mineral fertilization* of the crop rotation with alfalfa. The order *Streptosporangiales* had the lowest abundance in the soil of the *Forest shelterbelt* (<0.01%).

The orders included 20 families, and 34 genera. Most genera (7) were identified in the *Pseudonocardiaceae* family. The most abundant genera were: *Microlunatus* – 1.5% (the *Propionibacteriaceae* family), *Blastococcus* – 0.9% (*Geodermatophilaceae*), *Agromyces* – 0.5% (*Microbacteriaceae*), *Pseudonocardia* – 0.4%, (*Pseudonocardiaceae*), *Streptomyces* – 0.4% (*Streptomycetaceae*). The genus *Microlunatus* was present in all variants of the experiment with the abundance > 1%, it included 25 species of aerobic, chemo-organotrophic bacteria, some species can oxidize nitrates in anaerobic conditions and accumulate phosphates. The genus *Blastococcus* (12 species) had the lowest abundance in the uncultivated land of the *Forest shelterbelt*, and the highest abundance was determined in the *Control* and *Mineral fertilization* variants of the both crop rotations. The genus *Agromyces* (45 species), considered as an indicator of healthy soils, reached the maximum abundance in the uncultivated soil of the *Forest shelterbelt* and the unfertilized soil of the *Control* variants of the both crop rotations.

The metagenomic research of the typical chernozem demonstrated the presence of a great diversity of *Actinobacteria* with biotechnological potential both in the soils of the agricultural plots and of the forest shelterbelt. Finding correlations between the applied agricultural practices and the *Actinobacteria* diversity requires a further detailed study.

This research was carried out within the State Program Project 20.80009.5107 (2020-2023), financed by ANCD.