

Does the different mowing regime affect soil biological activity and floristic composition of thermophilous Pieniny meadow?

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The study area was located in the Pieniny National Park in the Carpathian Mountain (Southern Poland). About 30% of Park's area is covered by meadows. The climax stage of this area is forest. Therefore extensive use is indispensable action to keep semi-natural grassland such as thermophilous Pieniny meadows, which are characterized by a very high biodiversity. The purpose of this research was to answer the question, how the different way of mowing: traditional scything (H), and mechanical mowing (M) or abandonment of mowing (N) effect on the biological activity of soil.

Soil biological activity has been expressed by microbial and soil fauna activity. Microbial activity was described directly by count of microorganisms and indirectly by enzymatic activity (dehydrogenase - DHA) and the microbial biomass carbon content (MBC). *Enchytraeidae* and *Lumbricidae* were chosen as representatives of soil fauna. Density and species diversity of this *Oligochaeta* was determined. Samples were collected twice in June (before mowing) and in September (after mowing). Basic soil properties, such as pH value, organic carbon and nitrogen content, moisture and temperature, were determined.

Mean count of vegetative bacteria forms, fungi and *Actinobacteria* was higher in H than M and N. Amount of bacteria connected with nitrification and denitrification process and *Clostridium pasteurianum* was the highest in soil where mowing was discontinued 11 years ago. The microbial activity measured indirectly by MBC and DHA indicated that the M had the highest activity. The soil biological activity in second term of sampling had generally higher activity than soil collected in June. That was probably connected with highest organic carbon content in soil resulting from mowing and the end of growing season.

Higher earthworm density was in mowing soil (220 and 208 individuals m^{-2} in H and M respectively) compare to non-mowing one (77 ind. m^{-2}). The density of *Enchytraeidae* was inversely, the higher density was noted in N (34639 ind. m^{-2}) than in mowing one (16266 and 25904 ind. m^{-2} H and M respectively). The species diversity of *Enchytraeidae* was the highest in H variant (15 - number of determined species) next N (11) and the lowest was in M variant (9). There was noted decrease in soil fauna abundance before and after mechanical mowing, it was 50% for *Lumbricidae* and 32% for *Enchytraeidae*.

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