



THEME 2

Soil Macrofauna and Their Role in Soil Remediation

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INTRODUCTION

Soil Macrofauna & Soil Formation

The soil structure and formation of its humus horizon significantly depends on a vital activity of soil macro fauna.

Activity of soil inhabitants determines the rate of plant residues destruction and their mineralization, and accordingly the rates of turnover of organic compounds. The character of plant litter destruction, its structure and humus horizon formation entirely depend on the action of soil inhabitants.

The Dominant Groups of Soil Macrofauna

Georgia is among the 34 Hot spots of world bio-diversity, particularly as it concerns to the soil fauna. The goal of this research was to study the high mountain soil fauna of different regions of Georgia to make the comparison of soil fauna composition.

The major groups of soil fauna in the pilot sites of studied regions are invertebrates-saprophagous which occupy the leading position in the soil formation processes.



Fig. 1: Earthworms & Biohumus

METHODOLOGY

To study the species composition of high mountain ecosystems' soil inhabitants, their distribution and trophic structure, standard methods applied in soil zoology were used. Traps were used for gathering and defining the dominant species of soil invertebrates. A role of soil invertebrate-saprophages was shown in plant litter destruction processes, in enhancement of biological cycle of high mountain ecosystems and in maintenance of soil natural fertility. A complex research of high mountainous ecosystems, their components and their vital activities were investigated in two High Mountainous Regions of Georgia. The basic groups of high mountain meadows invertebrate-saprophages (millipedes, earthworms, insect, etc.) were determined.

Depth of population and occurrence of representatives of mesofauna were 50 cm in all three plots. The most populated were the top horizons of soil, namely to 30 cm, whereas there were only individual species of larvae of weevils and lamellicorns that laid deeper.

MAIN RESULTS

Researchers showed a leading position of earthworms on selected plots. It should be noted that in depression, the number of macrofauna representatives was several times less in comparison with raised sites. In our opinion the reduced number was caused by higher humidity of soil that was proven with the presence of hygrophilous kinds of macrofauna, such as earth-worms and by complete absence of steppe kind *Nicodrilus jassyensis* on the site.

Soil macrofauna structure stability greatly depends on pasture loading. An excessive overloading of pastures often leads to unrecoverable results which can be revealed with tamping and packing of soil and destruction of plant cover. All of it showed importance of active involving in soil forming processes of faunistic complex.



Fig. 2: Earthworm

Tab 1: The dominant groups of macrofauna in Stephantsminda Region (2000 m asl)

Macrofauna	Quantity					
	%	Ind/m ²	%	Ind/m ²	%	Ind/m ²
Lumbricidae	50.1	344	67	219	31.4	266
Myriapoda	27	188	1.5	5	50.6	429
Insecta	22.5	155	31.5	103	18	153
Total		687		327		848

Tab. 2: The Diplopods quantity in South Georgia (1400 m asl)

Months	Sites	Ind/m ²		
		I	II	III
V		128	2	203
VI		348	-	1206
VII		86	2	112
X		192	10	198
Total		754	14	1719

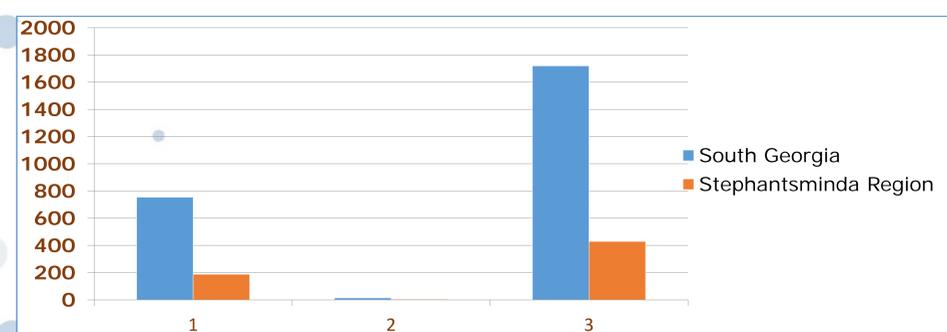


Fig 5: Quantitative Distribution of Macrofauna



NEW LIFE, THAT WE WOULD LIKE TO RECEIVE



Fig. 3: Soil map of Georgia



Fig. 4: High Mountain Landscape of Georgia

CONCLUSION

What Can be Done for Soil Remediation

It is very important to increase the soil fertility through the usage of fertilizer and green manuring which strengthens and enriches the soil with organic matters. Among the measures to improve the condition of pastures is the regulation of disordered and a chaotic overloading of pastures. Due to the damage caused by erosion, grass covering soil needs a longer rest period. Soil inhabitants have an important role in soil forming processes; hence we consider the necessity of preservation of soil invertebrates' biodiversity. The improvement of the soil productivity due to active organic fertilizers will be possible by introducing vermiculture. The development of vermiculture gives possibility to boost soil productivity.