



Erosion of soils and the ground desertification in Southwest Bulgaria (Ograzhden and Maleshevo mountains)

Ерозия на почвата и загуба на земеделски земи в Югозападна България (Огражден и Малешевска планина)

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One of the most important problems in temporary ecology is to examine the development of the erosion processes in under-analyzed territories, as well as the destruction and desertification of the lands associated with the erosion.

Ograzhden and Maleshevo mountains are situated in Southwestern part of Bulgaria near the state boundary between Bulgaria and Macedonia. According to most scientists who had carried out research in this region (Kitanov, 1982; Panov, 2000; Zakov, 2000, 2002) it is one of the most denuded and liable to erosion mountains in Bulgaria. The main reasons for this are its isolation from the various large scale forestation efforts done on the various territories of Bulgaria as well as the local traditions related with irregular maintenance and the mismanagement of the forests. All these have led to an activation of very strong erosion and denudation processes on the slopes of the mountain.

The goal of this research is to study the erosion forms in the region as well as the erosion processes which are occurring on the slopes of the mountains and which led to aggravation of the quality of the agricultural land, to destruction of the soils and ultimately to desertification of the region.

Most of the rivers and the tributaries, all of which form the hydrology system in this region, are temporary and they usually dry up throughout the summer period. The vertical erosion in river beds predominates because of the steep slopes, so the rivers are usually forming deep carved valleys. The erosion forms that had been generated by temporary streams on the river's slopes are young forms of the relief. They have been formed through single, double or few carving of the erosion streams which in the most cases are also associated with the intensive precipitation (Baltakov, 1986).

These kind of erosion forms are furrows, gulches ore gullies and waterless valleys. All of them are very widespread in Ograzhden Mountain because of the optimal conditions for their development (rocks, steep slopes and availability of intensive precipitations). Some of those forms were observed by Grain-metric analysis including sieve analysis and drawing up cumulative curves and histograms (Fig. 1).

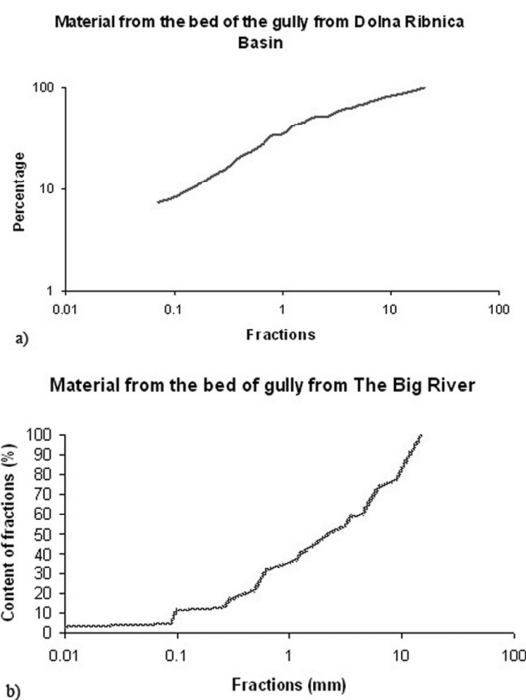


Fig. 1. Comparing alluvium material from gulches in Ograzhden and Maleshevo mountains: a) Dolna Ribnica Basin in Ograzhden Mountain; b) The Big River in Maleshevo Mountain



Fig. 2. Mud-stone stream of Dolna Ribnica River in Ograzhden Mountain

The active erosion furrows and gullies in the region and the favorable petrology composition have created conditions for the development of huge mud-stone stream which is not natural in the Bulgarian environment (Fig. 2). Those kinds of floods influence the relief, soils, agriculture lands and cause a lot of damages to the population in the areas as well as the infrastructure.

The comparison of the results from the two mountains leads to the conclusion that human agricultural activity plays a significant role in the development of the negative natural processes. In regions of Maleshevo Mt. where the forests are well preserved and agricultural activity is limited, the erosion is less intense. A future development of these processes with the same pace would lead to loss of agricultural land and a decline in the fertility of the soil.

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