



The effect of the layer interface on the distribution of infiltrated water in the profile of mountain podzol

Lukáš Jačka, Jiří Pavlásek, and Martin Kovář

Department of Water Resources and Environmental Modeling, Faculty of Environmental Sciences, Czech University of Life Sciences Prague, Kamýcká 129, Praha 6 - Suchbát, 165 00, Czech Republic (jacka@fzp.czu.cz)

The distribution and the accumulation of rainwater in the soil profile and the way of the subsurface runoff formation can be strongly affected by the soil layering. A mountain podzol characterized by the distinctly different eluvial and spodic layers is examined in this contribution. For the identified podzolic layers, field saturated hydraulic conductivity (Ks) and related soil properties (particle size distribution and bulk density) were measured. The preferential flow of infiltrated water in the soil profile was visualised using a dye tracer infiltration experiments. Distinct lateral flow on the eluvial-spodic interface of layers and water accumulation in the eluvial layer were detected by these experiments. In the spodic layer, only small patterns of dyed soil (limited entry of water) were noted. The probable reasons of the preferential flow in the eluvial layer were differences in soil hydraulic properties among the investigated layers. The measured Ks value was significantly lower for the spodic layer than for the layer located above (eluvial layer) and the layer located below (bedrock). This lower Ks value was probably caused by an accumulation of fine particles and various substances in the spodic layer and by corresponding changes in the porous system (coatings, blocking of effective pores, and reduction of the cross-sectional area). During intensive rain or snow melting, hydrological effect of the podzolic layer interface (water accumulation and formation of the shallow subsurface runoff) can be important.