



Reaction of Norway spruce (*Picea abies* (L.) Karst.) to sedimentation by toxic debris in the Dumitrelul Basin (sulphur mining area, Călimani Massif, Romania)

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The waste dumps of the sulphur mines of the Negoilul Românesc volcanic cone (Călimani Massif, Romania, 2100 m a.s.l.) are intensely reworked by poor intense geomorphic processes (e.g., flows, slides, and falls) out of the poorly consolidated deposits. These processes affect a Norway spruce (*Picea abies* (L.) Karst.) forest located between 1700 and 1320 m a.s.l. At the lateral boundaries of the Dumitrelul retention basin, *Picea abies* are covered with 30 to up to 200 cm of toxic, sulphur-rich sediments originating from the waste dumps deposits. This study aims at using sedimentological and dendrochronological methods to analyze the reaction of trees to sedimentation by toxic debris and to determine the time and depth a tree can support in such an environment.

Spatial distribution of features relating to the deposition of toxic debris-flow material and the precise determination of tree position were performed by topographical measurements using a Leica 407 total power station. A detailed geomorphic map (1/1000) of the basin area was obtained based on these field data. The dendrochronological study was performed with 20 buried *P. abies* trees. To analyze the height, extent and intensity of anatomical changes in the tree-ring records a set of 4 increment cores was extracted every 10 cm on the trunk of each tree. Another 20, non-affected *P. abies* trees were sampled to obtain undisturbed reference tree growth at the site and to compare it with growth anomalies (i.e. residuals) in affected trees. Preliminary results show that the affected trees reacted severely during or following years with sedimentation events. in addition, data shows that the intensity and persistency of growth reactions in trees are positively correlated with sediment depth and granulometry of debris-flow deposits.