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DROUGHT-DISTURBED NUTRIENT CYCLING AS A KEY LIMITATION FOR SPONTANEOUS RESTORATION: STUDY ON METALLIFEROUS POST-MINING SITES IN SERBIA

Nina Nikolic, Milos Stanojevic, Ana Paravinja, Predrag Bosnic, Miroslav Nikolic
Institute for Multidisciplinary Research, University of Belgrade, Serbia

Sessions

7.2. On a way to European Mining Restoration Guidelines

Abstract

Spontaneous restoration as an effective and cheap alternative might work on nontoxic post-mining substrates, while far less is known on its possibilities and bottlenecks on derelict land degraded by metal ore exploitation. Spontaneous establishment of vegetation on such land might last for centuries, with an outcome difficult to predict. Ecological engineering approaches nowadays focus on fostering pedogenic processes and modifying plant-soil interactions to initiate nutrient cycling, what is a pre-condition for ecosystem recovery. Revegetation is a crucial step on metalliferous post-mining land to increase content of soil organic carbon (SOC) and phytostabilize residual metals. This process is multiply constrained by several abiotic factors such as metal toxicity, nutrient deficiencies and imbalances, altered pH, and drought; the hierarchy of these constraints is not well understood. We shall present cases of copper (Cu), chromium (Cr), nickel (Ni) and lead (Pb) post-mining land undergoing spontaneous recovery on a time-scale from decades to centuries. Joint analyses of soil and vegetation characteristics have shown that elimination of drought factor facilitates spontaneous greening and the coupled nutrient cycling, despite the remaining high metal availability and low nutrient content.