

Abstract

As a result of minerals extraction, anthropogenically disturbed sites are created. In these sites we can study soil development, the rate of pedogenetic processes or the rate of nutrient accumulation. The aim of this thesis is to investigate the rate of sequestration and carbon stock in stone quarry soils in the area of granodiorite quarries near Skuteč, Czech Republic, where the quarries are different in successional age.

The material was collected using the method of quantitative sampling with samples of defined volume. In total, 69 samples from 24 sites were collected in defined depths of 0–10 cm, 10–20 cm and the LFH horizon. The successional age varies from 1 year (new level without woody plants) to 84 years (Derková, 2020). The samples were processed to obtain fine earth and then the total amount of carbon (C_{toc}) was analysed using mass spectrometer in the Stable and Radiogenic Isotope Research Laboratory at Faculty of Science, Charles University (Flash EA 2000 a TC/EA High Temperature Conversion Elemental Analyzer). Then the dependency between the rate of carbon sequestration, carbon stock and the successional age of the location was analysed using linear regression.

The result obtained indicate that the carbon stock increases with increasing successional age, whereas the sequestration rate decreases with increasing successional age. The 0–10 cm layer, which contains almost 70 % of carbon stock, has the biggest influence on the sequestration process. The total carbon stock in the oldest plots, older than 50 years, is on average 2.52 kg m⁻². The average sequestration rate after 30 years is 76.8 g m⁻² yr⁻¹ and the average for plot older than 50 is 45.7 g m⁻² yr⁻¹.

Key words: sequestration, primary succession, carbon, soil