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## Soil Organic Carbon Pools and Associated Soil Chemical Properties under Two Pine Species (*Pinus sylvestris* L. and *Pinus nigra* Arn.) Introduced on Reclaimed Sandy Soils

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**摘要**

The roles of different tree species and their impacts are key in assessing the dynamics of soil restoration in afforested post-mining sites. The objective of this study was to compare the effect of Scots pine (*Pinus sylvestris* L.), which is native to Central Europe and commonly used in afforestation, to that of the non-native black pine (*Pinus nigra* Arn.) on the development of carbon pools and the chemical properties of reclaimed soils after sand exploitation. The study was carried out in 20- and 35-year-old stands, and the results were compared to undisturbed forest sites. Samples of the litter horizon and mineral soils (0–5 and 5–20 cm) were analyzed for pH, soil organic carbon (SOC), and total nitrogen (Nt). In addition, electrical conductivity (EC), sorption complex properties, water-soluble carbon, and hot-water-extractable carbon were determined from the mineral soil samples. Scots and black pine had a similar effect on the properties of the reclaimed soils. However, the soils under Scots pine were characterized by lower pH values in the litter and 0–5 cm horizons, higher EC in the 0–5 cm horizon, and higher C stocks in the litter horizon. Changes in the C stocks and chemical properties with afforestation years were limited to the uppermost soil horizons (litter and 0–5 cm). For both pine species, soils under the older stands were characterized by lower pH, higher EC, higher exchangeable acidity, higher cation-exchange capacity, lower base saturation, higher SOC and Nt contents, and more stable soil organic matter than soil under younger stands. After 35 years, about 20% and 27% of the C stocks in the reclaimed mine soils had been restored under black pine and Scots pine, respectively

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from the higher C stocks in the litter horizons under Scots pine. Pedogenesis in post-mining sites after sand exploitation under pine species tended to result in more acidic and oligotrophic soils in relation to the undisturbed soils in adjacent forest ecosystems with pine. [View Full-Text](#)

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