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# Microbial characteristics of young soils on disposal sites of coal ashes

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Microbial communities are essential for a range of soil functions and their abundance and activity adjust to the degree of soil development and status. In young soils (aged up to an average of fifteen years) at four disposal sites of coal ash, microbial indicators were estimated for both the ecological and eco-toxicological evaluation of the soil quality. The alkaline disposals of coal ash contained high amounts of heavy metals and were mixed and overlaid with extra local soil and sediments of unknown quality. The new ash disposals have pH values of 9.5 and showed positive nitrogen liberation and negative carbon dioxide evolution during laboratory incubation in an open apparatus purging continuously ambient air. This indicates $CO_2$ sequestration in the deposits while microbial activity was present. In one-year old disposals sites, high organic carbon contents and also high microbial C and N contents, and microbial activities were determined. After fifteen years, large variations occurred between sub-plots due to the variation of the cover substrate and the ash-aging affecting management practices. Over the fifteen years of recultivation, the alkaline coal ash acidified to pH values of 7.7 and concurrently decalcified while the microbial biomass and activity were mainly related to N content. The heavy metal contents in the ash exceeded tolerable levels but seem presently not to repress seriously microbial colonisation and activity. The heavy metals will most likely affect microbial colonisation in advanced stages of soil development with pronounced acidification and lower alkalinity.