



Spatial variability of the dehydrogenase activity in forest soils

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The aim of this study was to assess the spatial variability of the dehydrogenase activity (DH) in forest soils using geostatistics. We have studied variability soil dehydrogenase and their relationship with variability of some physico-chemical properties. Two study areas (A and B) were set up in southern Poland in the Zlotoryja Forest District. Study areas were covered by different types of vegetation (A- broadleaf forest with beech, ash and sycamore), B- coniferous forest with Norway spruce). The soils were classified as Dystric Cambisols (WRB 2006). The samples for laboratory testing were collected from 49 places on each areas. 15 cm of surface horizon of soil were taken (with previously removed litter). Dehydrogenase activity was marked with Lenhard's method according to the Casida procedure. Soil pH, nitrogen (N) and soil organic carbon (C) content (by LECO CNS 2000 carbon analyzer) was marked. C/N ratio was calculated. Particle size composition was determined using laser diffraction. Statistical analysis were performed using STATISTICA 10 software. Geostatistical analysis and mapping were done by application of GS 9+ (Gamma Design) and Surfer 11 (Golden Software). The activity of DH ranged between 5,02 and 71,20 mg TPP• kg⁻¹ •24 h⁻¹ on the A area and between 0,94 and 16,47 mg TPP• kg⁻¹ •24 h⁻¹. Differences in spatial variability of the analysed features were noted. The variability of dehydrogenase activity on the A study area was described by an exponential model, whereas on the B study area the spatial correlation has not been noted. The relationship of dehydrogenase activity with the remaining parameters of soil was noted only in the case of A study area. The variability of organic carbon content on the A and B study areas were described by an exponential model. The variability of nitrogen content on both areas were described by a spherical model.