Soil aggregate stability represents an important characteristic of soil structure, which is closely connected
to soil erodibility, soil water regime, soil biota and soil nutrient availability. The soil particle arrangement into the
aggregates has a significant impact on the soil pore system and consequently on the soil hydraulic properties. The
degree of the soil aggregate influences water flux and solute transport within the soil profile (Kodešová et al. 2008,
2009a,b). The distribution of aggregate stability within the slope system is closely related to the terrain attributes
(such as slope, curvature, aspect) through their impact on various soil properties.

Study on relationship between soil aggregates stability and chosen terrain and soil properties was performed on
morphologically diverse study site in loess region of Southern Moravia. Haplic Chernozem is an original dominant
soil unit in the wider area, nowadays progressively transformed into different soil units along with intensive
soil erosion. An extremely diversified soil cover structure resulted from the erosion. Soil cover and material
redistribution on the plot was studied by Zádorová et al. (2010).

Soil analyses and detailed digital elevation model processing were the main methods adopted in the study. Soil
aggregate stability and various soil properties were analyzed in 15 sampling points located in representative
terrain and soil cover positions. The indexes of water stable aggregates (WSA) were determined using the
procedure presented by Nimmo & Perkins (2002). Topographic derivatives were obtained from a detailed digital
elevation model (DEM) derived from ground laser scanning procedure (Zádorová et al. 2010) and calculated
using integrated algorithms implemented in ILWIS 3.3 from the DEM: slope, plan, profile and mean curvature,
topographic wetness index (TWI), sediment transport index (STI) and stream power index (SPI).

Results showed decrease of aggregates stability mainly in exposed parts of the slope. Stability increase is evident
in stable and accumulation positions. Multiple linear regression showed dependency of WSA index on organic
carbon content. This result fully corresponds with numerous studies on aggregates stability. Relationship between
WSA and other analytic properties was not approved. Regression analysis showed strong dependency on plan
curvature. Soil aggregate stability heterogeneity can be related to the strong material redistribution on the slope
influencing particularly the organic carbon content in the plough layer. Terrain attributes, as one of the main
factors actuating on the surface runoff, showed strong relationship to the structure stability through plan curvature
index.

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