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Particle shape variations within a Luvisol profile

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Particle size distribution has crucial importance in soil physics. On the other hand particle shape properties were only taken into account in case of transport process investigations. Eolic or fluvial translocations have an effective impact on particle shape changes of loose sediment grains. Pedogenic processes also affect soil particle shape, however, this type of degradation and reformation based on chemical interactions. Moreover soil particles are strongly associated with each other and organic components hence the preparation of individual grains is difficult. Present study aims to compare particle size and shape data among several horizons of a Luvisol. The theoretically uniform initial sediment profile was differentiated due to pedogenesis and particle migration within the solum. Shape properties was estimated using two dimensional static image analysis. The applied device was Morphologi G3 by Malvern Instruments. Sample dispersion was made by high pressured air injection that scatters the particles onto a glass plate. The images are taken via a set of optics with various magnifications. Low (10 times) magnification was used for particles > 10 μ and high (50 times) magnification for particles < 10 μ. Particle size distribution was measured using the Fritch Analysette 22 MicroTec Plus laser diffraction device.
Preliminary results suggest that the clay size particles are more rounded compared to the bigger grains in each horizon. Most angular particles are in the parent material and on the surface, while the most rounded are in the "B" horizons. This result could be the effect of particle size distribution differences among the horizons, however size distribution results seems to be a function of the applied method, eg. image analysis or laser diffraction. Present study was supported by National Hungarian Research Found K100180, G. Jakab was supported by the János Bolyai fellowship of the HAS.