



Relief-induced soil zones at the Cretaceous sandstone-mudstone contact in the Stolowe Mountains, SW Poland

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Regolith translocation on mountain slope built of stratified rocks creates mixed or layered covers which may obliterate the actual transitions of rocks. The covers are seldom delineated on geological maps due to their insignificant thickness; however, enough large to influence the soil morphology and ecological functions. A toposequence of six soil sections situated at the contact of Cretaceous sandstone and mudstone was investigated to evaluate the influence of relief-position and morphological processes on slope cover formation, as well as soil and forest habitat arrangement. At least four distinct soil zones were distinguished in the 400 m long catena: (1) Arenosols and sand Regosols zone, on active fluvial cones and blocky covers directly below sandstone cliffs; (2) upper mid-slope zone of Podzols developed from sandstone-derived materials with periglacial features (solifluction) in the subsoil; (3) lower mid-slope and foot-slope zone of Stagnosols and Planosols with prolonged water stagnation over the impermeable subsoil developed from sandstone or mixed sandstone-mudstone regolith; excess of water is also the sign of mudstone bedrock that forces lateral water flow; and (4) toe-slope zone of Cambisols developed from the mudstone regolith. Past and present-day morphological processes have broadened the area mantled by sandstone-derived materials from upper-slope and created transitional materials that enhanced soil variability and multi-step zonality over the presumably sharp contact of sandstone and mudstone bedrocks.

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