



CLIMATE AND PARENT MATERIAL INFLUENCE ON DEVELOPMENT AND CHARACTERISTICS OF SOILS ON NON-CALCAREOUS LOESS IN CROATIA

Vedran Rubinic (1), Goran Durn (2), Stjepan Husnjak (1), and Neven Tadej (2)

(1) University of Zagreb, Faculty of Agriculture, Svetošimunska 25, HR-10000 Zagreb, Croatia (vrubic@agr.hr; shusnjak@agr.hr), (2) University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering, Pierottijeva 6, HR-10000 Zagreb, Croatia (goran.durn@rgn.hr; neven.tadej@rgn.hr)

Three profiles of the representative climax soils formed on non-calcareous loess (two Stagnic Cutanic Albeluvisols and one Luvic Stagnosol) were studied along the mean annual precipitation (MAP) gradient in the Pannonian region of Croatia. The purpose of the study was to compare the soil profiles' characteristics and to determine the main processes of their formation, in order to test the concept of soil climosequence on non-calcareous loess in this part of the Pannonian Basin. Each soil profile was opened on level plateau terrain and under well developed forest vegetation (Epimedio-carpinetum betuli community). The results pointed to several soil characteristics as consistent with the precipitation gradient. At the same time, given the merely partial uniformity of loess parent materials across the investigated transect, clay content and cation exchange capacity (CEC) of the soil profiles studied did not correspond to the MAP gradient. Although all three soil profiles developed from pre-cycled and post-depositionally modified loess parent materials of same provenance, the uneven environmental conditions of eolian depositions caused variations in loess characteristics, i.e. formation of brown loess at the site of one analyzed profile and loess derivatives at the sites of two remaining profiles. Therefore, climosequences *sensu stricto* could not have formed on non-calcareous loess in the Pannonian region of Croatia. Nevertheless, the effects of acidification and pseudogleization were found to be least expressed at the site with the lowest MAP, and most expressed at the site with the highest MAP. At the other hand, rate of lessivage, as the third major pedogenic process identified, did not increase along with the increase of MAP, i.e. it depended more on soil pH and clay mineralogy, than on the amount of precipitation.

Keywords: Stagnosols; Albeluvisols; Loess derivatives; Brown loess; Climosequence.