

Soil Age: Past, Present, Future

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Time is important factor of soil formation. Soil as every natural-historic body has a certain age. In soil science there is a fair chrestomatic opinion that “soil is mirror of landscape”, which reflects modern environmental parameters. But soil profiles aren’t always adequate to modern conditions of soil formation and do not reflect present landscape. Sometimes they keep features of previous stages of development, and in this way reflect former landscape parameters. Such soils are not only the “mirror of landscape”, as one of the most important postulates of soil science, but also a “memory of landscape”, which preserve relict properties and may be used for paleogeographic reconstructions [1]. Evolution of soils takes place with evolution of landscapes, but those properties that formed in soil in previous conditions do not disappear completely, but are inherited and preserved for a certain period of time.

Soils are subdivided on monogenetic and polygenetic. Monogenetic soils formed in a period when the variation in environmental factors was too small, i.e. the direction of soil development was constant; polygenetic soil formed in two or more periods when the environmental factors were sufficiently different to produce detectably different assemblages of soil features, i.e. the directions of soil development were different in the periods involved [Paleopedology Glossary].

Relict features in soils (buried horizons or separate relict features within soil profiles) are the base for paleogeographic reconstructions. Relict soil features may result due to changes of hydrological regime, climatic variations, etc. Buried soils provide an opportunity to restore past environments. Buried soils are wide spread, where changes in sedimentation took place. Such changes could be due tectonic activities, glaciations, etc.

In the history of the Earth the changes of soil cover, burying of the old and formation of the new pedospheres on the new sediments or on the remains of old soils permanently took place. In the evaluation of modern soils it is necessary to distinguish some of the problems: age of soil cover, age of certain profile, age of soil horizon.

Soils possess three categories of properties: lithogenic (inherited from parent rock), relict soil features (inherited from previous pedogenesis) and modern soil features (formed under the influence of modern environment. If soil thickness has same age, it means that horizons are syngenetic, formed together at the same time, but if the age of layers is different - soils are polygenetic. Traditionally paleosols are regarded as good records of paleoecological and paleoclimatic changes [2].

Micromorphology proved to be an informative tool in separating modern and relict features in soils [3]. We applied it for various soils of Georgia and in this paper present our results of micromorphological studies.

Reference

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