



S01: Early-Middle Pleistocene transition: local records, global correlations

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Sarakul paleosol of the Eopleistocene final in the Southern Urals (Russia)

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Sarakul paleosols revealed in the Southern Urals have a stable position in geological sediments and they can indicate the Eopleistocene-Neopleistocene boundary. These paleosols can be used as stratigraphic and paleogeographic markers and a source of information on the environment as well. However, data on them are extremely scarce. These paleosols disclosed in four sites are located in the mountain part of the Southern Urals on the Miass River erosion-accumulation terrace (two sections are called Miass) and at the eastern edge in the trans-Uralian peneplain (two sections are called Baturino). Their location is confined to the subzone of pine-birch forests in the Mountain Urals (Miass sections) and to the southern regions of the Trans-Urals forest-steppe zone (Baturino sections), respectively. Sarakul paleosols have a relatively thick and dense humus horizon with the tongued lower boundary of cryogenic genesis. The paleosols are dark grey with the TOC content that is relatively high for Eopleistocene-Pleistocene paleosols. The humus horizon is polygenetic. Two superimposed on each other parts corresponding to different conditions of their formation are distinguished in this humus horizon. The slightly humified sediments are sometimes interbedded between them. Characteristics of these sediments indicate colder environmental conditions. Within certain natural areas, this regularity is kept.

Sarakul paleosols formed in different localities of the Southern Urals are variable in some physico-chemical properties: TOC and carbonate content, soil reaction, humic acids to fulvic acids ratio, elemental composition of humic acids, optical properties, and spectral characteristics, etc. Based on cumulative features of pedogenesis, it can be stated that climatic conditions changed from relatively warm and highly humid towards warm and relatively drier during the period when the Sarakul paleosols were formed. Miass paleosols were formed under periodical or continuous high-moisture conditions. Humidity in the area of trans-Uralian peneplain was within the range of steppe or forest-steppe conditions.