



On Russian concepts of Soil Memory – expansion of Dokuchaev’s pedological paradigm

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Having developed from Dokuchaev’s research on chernosem soils on loess, the Russian school of pedology traditionally focused on soils as essential component of landscape. Dokuchaev’s soil-landscape paradigm (SLP) was later considerably advanced and expanded to include surface soils on other continents by Hans Jenny.

In the 1970s Sokolov and Targulian in Russia introduced the new term of soil memory as an inherent ability of soils to memorize in its morphology and properties the processes of earlier stages of development. This understanding was built upon ideas of soil organizational hierarchy and different rates of specific soil processes as proposed by Yaalon. Soil memory terminology became particularly popular in Russia which is expressed in the 2008 multi-author monograph on soil memory. The Soil Memory book edited by Targulian and Goryachkin and written by 34 authors touches upon the following themes: General approaches (Section 1), Mineral carriers of soil memory (Section 2), Biological carriers of soil memory (section 3) and Anthropogenic soil memory (section 4). The book presents an original account on different new interdisciplinary projects on Russian soils and represents an important contribution into the classical Dokuchaev-Jenny SL paradigm.

There is still a controversy as to in what way the Russian term soil memory is related to western terms of soil as a record or archive of earlier events and processes during the time of soil formation. Targulian and Goryachkin agree that all of the terms are close, albeit not entirely interchangeable. They insist that soil memory may have a more comprehensive meaning, e.g. applicable to such complex cases when certain soil properties whose origin is currently ambiguous cannot provide valid environmental reconstructions or dated by available dating techniques. Anyway, not terminology is the main issue. The Russian soil memory concept advances the frontiers of pedology by deepening the time-related soil functions and encouraging closer cooperation with isotope dating experts. This approach will hopefully help us all in better understanding, management and protection of the Earth’s critical zone.