Contribution of Micromorphology to Classification of Aridic Soils

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Abstract The function of micromorphology is perceived as the interpretation of phenomena and aid in recognizing diagnostic horizons in the major soil classification systems of the world. The micromorphological contribution to the diagnostics of the horizons in soil classification comprises the complementary characteristics and/or confirmation of the genetic implications on a horizon, the clarification and identification of the horizon with its differentiating criteria. Hence, the application of micromorphology to soils of (sub) arid regions is promising in discriminating the pedogenic properties from the inherited ones, assessing the development and degradation of structure, the re-arrangement of soil solids by pedofauna and other agents, explaining the nature of clay-enriched subsoil, as well as the behavior of carbonates and gypsum. These functions are helpful in solving problems related to aridic soils, whose diagnostics comprises the identification of yermic, takyric, cambic, calcic, (paleo) argic horizons and features derived from accumulation of salts.

Keywords Russian soil classification system · horizons · microstructure · aeolian features

1 Introduction

In many publications concerning the contribution of micromorphology (MM) to the development of major world soil classification systems (1981, 1985, 1991, 1998), the function of MM is perceived as the interpretation of phenomena and aid in recognizing diagnostic horizons. Although the horizons are declared to be identified...
by properties, basically morphological ones, the choice of properties, their ranking and some other procedures are controlled by the concepts of soil genesis.

According to L. Wilding MM is a «marker for genesis» and soil classification (1985). Hence, the application of MM to soils of (sub) arid regions is promising in discriminating the pedogenic from the inherited properties, assessing the development and degradation of structure, the re-arrangement of soil solids by pedofauna and other agents, explaining the nature of clay-enriched subsoil, as well as the behavior of carbonates and gypsum. These functions are helpful in solving problems related to aridic soils, whose diagnostics comprises the identification of yermic, takyric, cambic, calcic, (paleo) argic horizons and features derived from accumulation of salts.

It is worth emphasizing that the imprints of structural and textural events are well preserved in the arid climate; this was a challenge for soil scientists in the beginning of the 20th century and now, facilitated by the MM studies (Allen 1985). Another noteworthy particularity of aridic soils is that their topsoils are “fair mirrors” of the present-day environment unlike their subsoils, which have a “long memory”.