ESTIMATION OF CARBON POOLS AND DEPOSITARY FUNCTION OF PERMAFROST-AFFECTED SOILS OF YAMAL REGION

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There are many gaps in current state of knowledge of organic matter in permafrost-affected soils. At the same time numerous investigations showed that permafrost-affected landscapes serve as a huge reservoir of organic matter. This work is aimed to specify soil and landscape diversity of southern Yamal, assess existing carbon pools and depositary functions in soils formed in permafrost-affected landscapes of Yamal region. Soil diagnostics has been performed according to Russian soil classification system and WRB. It was concluded high soil diversity according to RSCs: all 4 trunks are represented, postlithogenic trunk was the most abundant (6 orders, 8 soil types and 5 subtypes), organogenic trunk is represented by 1 order (peat soils), sinlithogenic trunk were represented in river valleys not only by alluvial soils, but also by stratified soils. Morphometric analysis of soil horizons revealed the mean thickness of Stagnic horizons as 19.7 ± 2.7 (23.4 ±2.5) cm, Histic horizons – 9.9 ± 2.1 cm, other types of organic horizons (litter, raw-humus and greyhumus) – at the same level 5.4 ± 2.3 cm, cryogenic horizon - 25.0 ± 7.4 cm). Soils for most of studied sites were characterized predominantly by acidic to strong acidic pH. Profile distribution of carbon, nitrogen and C:N ratio showed non-gradual changing with the depth due to manifestation of cryopedogenesis in soil profiles which lead to cryogenic mass transfer. for study area were 7.85 ± 2.24 kg m^{-2} (for 0-10 cm layer), 14.97 ± 5.53 kg m^{-2} (for 0-30 cm), 23.99 ± 8.00 kg m^{-2} (for 0-100 cm). Analysis of soil organic carbon stocks among predominant soil types (Russian soil classification system) revealed relatively high variability of values in 0-10 cm (from 4.50 kg m^{-2} in Peaty Gleyzem underlain by permafrost to 9.59 kg m^{-2} in Peaty Podzol underlain by permafrost) and 0-30 cm layers (from 9.90 kg m-2 in Cryic Podbur underlain by permafrost to 24.15 kg m^{-2} in Eutrophic peat soil underlain by permafrost). Active layer thicknesses were measured by vertical electrical resistivity method, which allowed to non-directly (without any mechanical disturbance of soil cover) assess the active layer and permafrost table. Active layer thickness at different study sites was estimated predominantly from 45 to 120 cm. Analysis of trace elements content showed poorly manifested eluvial-illuvial differentiation of soil profiles of studied natural soils of Yamal region. The highest contents for most of studied trace elements were found in Histic topsoils horizons (strong sorbent of microelements), geochemical barriers (in gleyic horizons caused by seasonal water saturation in the middle part of soil profiles or at superficial layer). The data reported in this work should be assessed for global estimations of organic carbon budget and dataset on soil characteristics of permafrost-affected soils.