**Spatial variability of soil properties in the floodplain of a river oasis in the Mongolian Altay Mountains**

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Due to the fertility of alluvial soils, their smooth topography and easy access to water, floodplains are favored areas for agricultural production. These factors allow the small-scaled cultivation of crops and hay even under the arid climate conditions of the river oasis Bulgan sum center located in the foothills of the Altai Mountains, Western Mongolia. Previous studies in this river oasis suggested a negative effect of agricultural land use on soil quality as indicated by soil biological parameters which, however, were characterized by high spatial heterogeneity. This study aimed at a further characterization of the spatial variability of major soil properties within the flood plain of Bulgan sum center and the determination of factors which were responsible for the variation of soil biological properties.

Within an area of 4 ha in the flood plain topsoil samples were taken every 20 m using a regular grid. Samples were analyzed for physico-chemical (e.g. electrical conductivity (EC), inorganic carbon (C), pH, texture, total C) and biological properties (e.g. basal respiration, ergosterol, microbial biomass C). The coefficient of variation (CV in %) was calculated as a measure of spatial variability. Spearman correlations were performed between soil biological and physico-chemical properties.

While pH values were almost homogenous within the 4 ha (CV = 12 %), biological soil parameters were characterized by a relatively high variability (basal respiration: CV = 46 %, ergosterol: CV = 63 %, microbial biomass C: CV = 41 %). EC and inorganic C, however, were extremely variable within the area (CV = 86 % and 163 %, respectively). The variation of the biological parameters primarily reflected the spatial distribution of organic C (average r2 = 0.62, *p* < 0.01), while for ergosterol and for microbial biomass C a positive relationship with EC (r2 = 0.57, *p* < 0.01) and with the clay content (r2 = 0.43, *p* < 0.01), respectively, was detected.

The observed variabilities confirm previous observations and are comparable to other floodplain studies. Results underline the significance of organic carbon to preserve the scarce and susceptible agroecological resources of river oases in Central Asia.

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