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Soils of the Eastern mountainsides of the southern Sikhote-Alin (on the example of Lazovsky nature reserve, Russia)

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The most common soils of the southern Far East are Brownzems under Russian classification (Cambisols), which are the zonal ones, emerging on the steep slopes and tops of hills, on high river terraces under broad-leaved and cedar-broad-leaved forests. Those soils formed due to two processes: organic matter metamorphism and clayization by siallite, leading to the formation of clay-metamorphic horizon w. The main morphological features of Cambisols are not deep soil profile (50 - 70 cm), weak horizons differentiation, with lots of cobble. Chemically those soils are low saturated, even in the humus horizon. Distribution of total absorbed bases is mostly accumulative, which is related to the distribution of humus in these soils, and the predominant type of clay fraction distribution of.

The only exception are Humic Cambisols and Humic Cambisols Calcic which were formed on redeposited products of limestone rock weathering. Fine-grained deposits are mainly loams with a low content of silt. Silt distribution has an accumulative character with a gradual decrease in the content of silt down from the top of the profile.

Layer of fresh leaf fall is very common for the Humic Cambisols surfaces, and under it there is the litter of plant residues with different degrees of decomposition. Accumulative humus horizon is dark gray with brownish tint, thin, from 10 to 15 cm in depth, loose, crumbly, highly penetrated by roots, with a strong granular structure, with aggregates tightly attached to the root hairs, sandy loam or sandy clay loam. The middle horizon is brown, yellowish-brown, divided into sub-horizons, with different color intensity, density, soil texture and amount of cobble.

Dystric Cambisols are acidic or strongly acidic with low saturation of soil absorbing complex. Due to amount and distribution of organic matter these soils can be divided into two groups. The first group is soils with accumulative humus distribution: with a low depth humus-accumulative horizon (11 – 12 cm) and high content of organic matter (23 – 26 %); humus in the upper horizons mainly consists of humic acids, while in lower horizons it is with higher ratio of fulvic acids. The second group is soils with a gradual humus distribution along the profile and with a smaller amount of organic matter in the upper horizon (9 – 13 %) and with no differentiation in humus composition.

Folic Cambisols are formed on the watershed surfaces, on the steep slopes under pine and oak trees. Under thin litter horizon these soils have organic-accumulative horizon of well decomposed organic matter, but in contrast with Dystric Cambisols it doesn't have strong granular structure. At the bottom the organic horizon is humic-impregnated or has clear streaks of humus.

Humic Cambisols are formed in the lower parts of slopes, on steep slopes and high river terraces under pine and deciduous forests. All this soils have humified litter horizon, which is up to 7 cm in depth, weak differentiation of the soil profile, deep humus-accumulative horizon (18 - 31 cm) with dark gray, almost black color, with strong granular structure and loam or clay loam texture. Soil acidity is determined by the lithogenic basis. Base saturation is quite high (77 - 90%) in mineral horizons and is up to 70 % in organic and accumulative ones. There is a high amount of humus on the entire profile (5 – 16 %), which consists of humic acids in the upper half of the profile and of fulvates at the bottom.

Humic Cambisols Gleyic are located in the lower parts of gentle slopes under mixed forest. Due to higher moisture at the lower parts of slopes this soils have signs of weak gley process in dense subsoil horizons in the form of small light grey spots.

Humic Leptosols are weakly developed soils formed on rocky hills, boulders, rocky outcrops, under thick moss layer, under which is a layer of weathered gravel rock.

Humic Cambisols (Calcic) are formed on the surface sediments of limestone. They have a deep soil profile, up to 40 cm and it's humus-accumulative horizon is dark gray or black, gradually passing into soil-forming rock. Bw horizon, typical for Cambisols, is weak.