

## Ecological characteristics of larch ecosystems in northeastern Eurasia.

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Deciduous conifer, i.e. larch (genus *Larix*), dominates in large area of northeastern Eurasian Continent. Continuous permafrost region also expands above ca. 60 degrees N latitudinally, and from the Yenisei River to the eastward of the Kolyma River Lowland longitudinally. Larch forests reach to more than 70 degrees N as sparse forested area. This area is the only unique region on the Globe, where forest ecosystems exist on the continuous permafrost. Mean annual temperature often ranges below -5 degrees Celsius and little annual precipitation with 200 - 350 mm, which is an exceptional climate condition for forest distribution. Discontinuous and/or sporadic permafrost exists in the marginal region of continuous permafrost, including Amur region, Da Hinggang Mountains, the Baikal region, and northwest Mongolia. The degree of larch dominance decreases for these marginal regions, however, larch dominates in Da Hinggang Mountains.

Common knowledge that podzolic soils under coniferous forests are typical under cold climate is not valid in northeastern Eurasia. Podzolic soils are not dominant in this larch ecosystem, and moreover, some soils above 60 degrees N show neutral or alkaline pH due to hyper-continental climate condition. Soil parent materials are quite different between central and eastern Siberia. Weathered rock fragments originated from basalt mantle plume in the Paleozoic Era are main parent materials in central Siberia, whereas, alluvial sediments and/or lacustrine deposits are main soil parent materials in eastern Siberia. Average value of soil organic carbon storage in central Siberian larch forests is smaller than that of eastern Siberia, and average C/N ratio in central Siberia is higher than that of eastern Siberia.

Larch ecosystems in northeastern Eurasia regenerate by replacing fires with several decades to hundred year interval. Regenerated stands show vigorous growth until after 20-30 years, however, later then stand biomass reaches asymptotic values. Self-thinning rule in plant population is not valid in permafrost larch ecosystems. Subsidence and re-rising process of permafrost table after fire recovery affects mortality process and forest stand structure.

Dense root system of larch tree elongates in active layer has an important function for individual growth and survival. Nutrient deficit may be a trigger to allocate more production to root system. Top/root ratio (T/R ratio) of larch in this region has ranging from 1 to 2, which is very low compared to other evergreen coniferous northern forest (4 - 5).