

## Nitrogen as a controlling factor of larch growth in taiga-tundra ecotone in arctic region, northeastern Siberia

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Eastern Eurasia is covered by permafrost which is the largest and the deepest in the world, and in arctic region, larch dominated taiga-tundra boundary ecosystem, exists on it. It is expected that larch growth in arctic ecosystem is greatly affected by warming-mediated changes in soil moisture condition and possible availability of N. It is necessary to investigate the biogeochemical relationship between larch growth and soil property which governs soil N and soil moisture. Observations were conducted across the sites that varied in tree density and topography, near Chokurdakh (70.6°N, 147.9°E), Sakha, Russia, in every July from 2009 to 2011. Photosynthetic rate, N content, C and N stable isotope ratios of needle, and needle mass as well as tree size were observed for larch. Besides, soil N and soil moisture were measured.

Wet area without trees growing showed considerable higher soil moisture than places grown by the trees. The needle delta C-13 was positively correlated with needle nitrogen content and needle mass across the sites. Needle N content was related to soil NH<sub>4</sub><sup>+</sup> pool. The sites with higher the topography level and lower soil moisture showed larger needle mass and larger tree sizes than the sites with wetter condition. Nitrogen content of needle in the year was positively correlated with needle delta C-13 in the following year.

These results show that soil moisture plays an important role in larch survival and soil N availability contributes to larch growth, which is possibly limited by high soil moisture.

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