

Abstract

The thesis deals with the influence of thermal conditions on the growth of the trees along the slopes with differing exposure to solar radiation in the alpine treeline ecotone in the Eastern Giant Mountains.

Methodological approach was based on the measuring of the tree top and root zone temperatures, measurement of the dendrometric parameters (tree height, length increment) and radial increment of the Norway spruce (*Picea abies*).

The results show only weak relation between significant temperature characteristics and exposure effect in the alpine treeline ecotone, which correspond to the growth rates of the sampled trees.

Slightly higher temperatures were found on the south-facing slopes during the growing seasons in case of the closed canopy forest. Soil and air temperatures in tree groups were a bit higher on the north-facing slopes.

In closed-canopy forest there was larger radial increment on south-facing slopes of Luční hora, on the slopes of Malý Šišák there were similar growth trend on both slope exposures. In tree groups there were found larger increments on north-facing slope of Luční hora, on the sampled sites of Malý Šišák there were found larger increment on south-facing slope during the 20th century, then in last decade larger increment was recorded on north-facing slope.

Based on standard tree-ring chronologies there was found increase in tree-ring widths during 60s and beginning of 70s of the 20th century. That was consistent with the increase of average temperatures in the corresponding period. In contrast, there were detected the growth depression at the end of 70s and during 80s of the 20th century. The effect of the air pollution is the reason for this decline. Then there were found the period of increased tree growth at all sampled sites. It may be a consequence of increased air temperatures as well as nitrogen input during the 90s of the 20th century.

During the period of obtained temperature data it was found that the larger increment corresponds to the higher temperature on all sampled location in closed-canopy forest as well as in the tree groups.

It can be summarized that the potentially favorable slope aspect is partly reflected in the closed-canopy forest while in the tree groups there were not detected. These results are probably affected by local topography and air flow in the sampled area.