

Ground-fire is not a significant event reducing shoot photosynthesis and stomatal conductance in the canopy of mature larch stand in eastern Siberia: A field manipulation experiment

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Abstract

An artificial ground-fire experiment was conducted with the aim to analyze shoot photosynthesis and stomatal conductance in the canopy of a mature larch (*Larix cajanderi*) stand near Yakutsk, Russia. In July 2004, ground vegetation and the half mass of the organic layer in soils in a 8×8 m plot in the stand was artificially burnt by hand-burner. This treatment resulted in the increase of soil temperature up to over 400°C, 100°C and 20 to 50°C at 0, 5 and 10 cm depth from the ground surface, respectively. Thereafter, there was no significant difference in soil moisture content between burnt and control sites. No significant reduction in the light saturated net CO₂ assimilation rate (Asat), stomatal conductance (gs) and leaf water potential in the canopy was found in the burnt site. The migration of midday depression of Asat in the afternoon was found in the burnt site. During the next summer, no significant difference in Asat and gs were found between control and burnt sites. In the summer 2006, the Asat was slightly higher in burnt sites than in control sites. Higher Asat was accompanied with significant higher V_{cmax} that resulted from A-Ci curve. Therefore, we conclude that the light burning of ground fire was not a significant event that reduces photosynthesis and stomatal conductance of shoot in the canopy of mature larch stand in eastern Siberia.

Key words: Ground fire, *Larix cajanderi*, Photosynthesis, Stomatal conductance, Eastern Siberia

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