

<T2-16> The effect of moss height on regeneration of *Picea jezoensis* on fallen logs

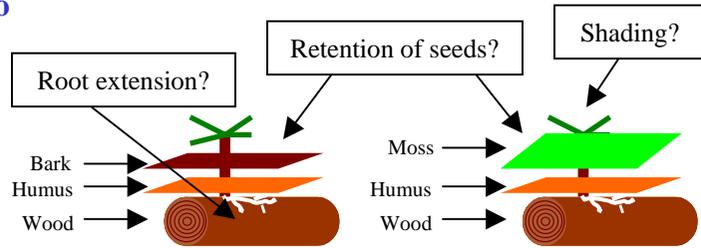
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Introduction

Picea jezoensis: a major tree species in Hokkaido

- *Picea jezoensis* exclusively emerges on fallen logs.
 - Seedlings density differs depending on the decay rate like as moss height of fallen log.
 - Presence of moss and its height were pointed as the limitation factor of survival and growth of seedlings on fallen logs.
1. Seeds may be trapped in moss layer and inhibited to reach wet humus layer.
 2. Root extension to humus layer may be inhibited by hard bark.
 3. Seedlings may be shade by tall moss.



How affect the moss height on the survival and growth of *Picea jezoensis* ?

Materials & Method

Study Site

- Taisetsuzan National Park, Hokkaido, northern Japan
- Stand condition: Natural coniferous forest dominated by *Picea jezoensis*, *Picea glehnii*, and *Abies sachalinensis*

Establishment of plots

- Fallen logs were classified as with bark (FL_B), with short (1-20mm) moss (FL_S), and with tall (> 20mm) moss (FL_T).
- Four of FL_B and FL_S, 10 of FL_B, FL_S, and FL_T were selected in 2002 and 2003.
- One hundred seeds were scattered on each fallen logs at early May in 2002 and 2003.

Germination and survival analysis

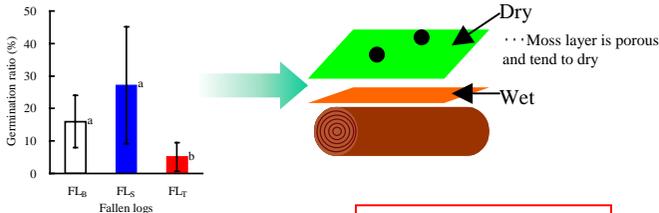
- Seedlings dynamics were monitored by 1 week until 20 October, 2003.
- Seedlings were excavated and the tap root length of them which existed in bark or moss, humus, and wood layer were measured.
- Mortality factor of seedlings were divided into disappearance, standing dead, and herbivore attack.

Growth analysis

- Seedlings in each fallen logs were sampled at 20 October, 2003.
- The length and dry weight of needles, stem, and roots of seedlings were measured.

Results & Discussion

Germination



Tall moss inhibited seeds to reach wet humus layer

Survival

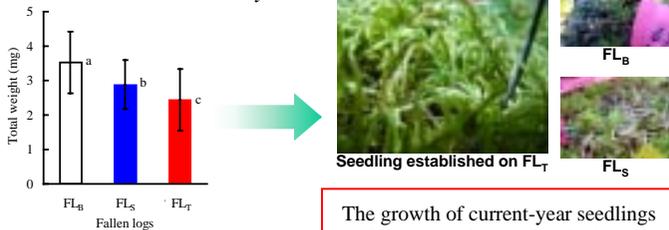
- Survival rate of current and one-year seedlings were not significantly different among fallen logs.
- Eighty percent of the tap roots of living and dead seedlings were distributed in the humus and wood layers of the logs, irrespective of moss height.
- Current-year seedlings died of disappearance and herbivore attack. One-year-old seedlings died of standing dead.

Moss height did not affect the early survival of *P. jezoensis* seedlings.

Germination ratio

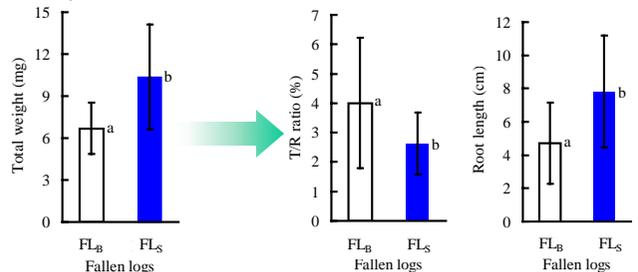
Different symbols indicate statistically significant differences between fallen logs. This is same in other graphs.

Growth · Current-year



The growth of current-year seedlings on FL_T were inhibited by shading

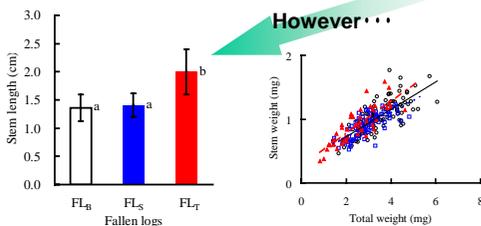
· One-year



Dry weight of seedlings T/R ratio and root length of seedlings

The root extension of one-year seedlings on FL_B were inhibited because of hard wood, which caused the low biomass of them.

Dry weight of seedlings



The seedlings on FL_T acclimated to shading by making long stem

Stem length of seedlings Stem allocation of seedlings

○ : FL_B □ : FL_S ▲ : FL_T

Conclusion

- The fallen logs with short moss like FL_S is the safe site for early survival and growth of *P. jezoensis*.