

J. Jpn. For. Soc. 83(4): 334–339 (2001)

Sex Expressions and Size Structures of a Dioecious Canopy Tree Species, *Fraxinus mandshurica* var. *japonica*

Yasuo Takahashi,* Susumu Goto, Hisatomi Kasahara, Masako Inukai, Norikazu Takada, Kazunobu Iguchi, and Shinsaku Shibano

University Forest in Hokkaido, Graduate School of Agricultural and Life Sciences, The University of Tokyo, Yamabe, Furano 079–1561, Japan.

Fraxinus mandshurica var. *japonica* is a dioecious canopy tree species that widely distributes in riparian forests in Hokkaido. We investigated sex expressions and size structures in DBHs of *F. mandshurica* var. *japonica* in the Tokyo University Forest in Hokkaido (Furano). In the Iwanazawa large study area (18.75 ha) located in natural riparian forests, the numbers of juvenile, female and male trees were 135 (19.6%), 293 (42.6%) and 260 (37.8%), respectively. The sex ratio of flowered trees did not significantly differ from 1:1. Juvenile trees were significantly smaller than flowered trees. Size structures were not significantly different between female and male trees. We also investigated those of *F. mandshurica* var. *japonica* in 27-yr and 50-yr artificial forests. Only 4 out of 525 trees (0.8%) flowered in the 27-yr forest. In contrast, 272 out of 558 trees (48.7%) flowered in the 50-yr forest. In the 50-yr forest, size structures of both juvenile *versus* flowered trees and female *versus* male trees were similar to those in the natural riparian forest. In addition, we found that sex expressions of 98 phenotypically superior trees of *F. mandshurica* var. *japonica* were significantly male-biased. As *F. mandshurica* var. *japonica* is important commercial species that is superior in wood quality and straightness, managements of those sex expressions in forestry should be considered.

Key words: dioecy, *Fraxinus mandshurica* var. *japonica*, riparian forest, sex expression, size structure

* Corresponding author (E-mail: takahasi@uf.a.u-tokyo.ac.jp)

J. Jpn. For. Soc. 83(4): 340–346 (2001)

The Role of Riparian Trees in Providing Wintering Habitat for Juvenile Masu Salmon (*Oncorhynchus masou*) in Southwestern Hokkaido, Northern Japan

Seiji Yanai,^{1,2,*} Mitsuhiro Nagata,³ Yu Nagasaka,¹ Hirokazu Sato,¹ Mahito Miyamoto,³ and Shinichi Okubo³

¹ Hokkaido Forestry Research Institute

² Department of Environmental Design, Hokkaido Institute of Technology, 7-15-4-1 Maeda, Teine, Sapporo 006-8585, Japan.

³ Hokkaido Prefectural Fish Hatchery

Behavior and microhabitat selection by masu salmon (*Oncorhynchus masou*) under severe winter conditions were monitored for two years in a channelized section of Shakotan River, southwestern Hokkaido, northern Japan. The study section was divided into one square meter mesh, and fish were collected using an electrofisher in each mesh. The juvenile masu salmon strongly preferred to live along lateral margins of both banks. Their physical habitat characteristics were represented by moderate current below 0.2 m/s, dense cover created by snow and vegetation, and fine sediment substrate. However, remarkable preference for any current depth was not observed. The gut contents analysis revealed that they consumed slight amounts of small aquatic invertebrates such as mayfly, caddisfly and midge during midwinter. Discriminant analysis also demonstrated that instream cover and surface current velocity were especially important environmental variables. Based on these facts, it is clear that juvenile masu salmon are dwelling in the microhabitat created by snow and riparian vegetation to minimize swimming energy. The fallen tree trunks and tree shoot stretching from the banks play a very important role in providing a favorable wintering habitat for them.

Key words: cover, masu salmon (*Oncorhynchus masou*), microhabitat, riparian vegetation, wintering

* Corresponding author (E-mail: yanai@hit.ac.jp)

Short Communications

J. Jpn. For. Soc. 83(4): 347–350 (2001)

Differences in the Severity of Needle Yellowing and Dieback among the *Picea glehnii* Families in the Provenance Test Site

Masahiko Kadomatsu,* Kiyoshi Kaneko, Kiyomi Arikura, Kazu Ichikawa, and Jun Yon Cha

Forest Research Station, Field Science Center for Northern Biosphere, Hokkaido University, 250 Tokuda, Nayoro 096-0071, Japan.

In an 11-year-old provenance test site, many trees of *Picea glehnii* showed phenomena of unknown cause, like needle yellowing and dieback. To elucidate differences in damage among the families, we investigated the degree of damage and heights of the planted trees. We found that individuals with severe damage tended to be lower in height. The degree of damage varied among the families and a relationship between average height and degree of damage was not found in several families. The relationship between provenances and damage is not clear, because the degree of damage differs greatly among the families within each provenance. Although it is necessary to confirm the cause of the damage, some families are probably more susceptible to damage than others.

Key words: dieback, needle yellowing, *Picea glehnii*, sapling, variation among families

* Corresponding author (E-mail: kado@exfor.agr.hokudai.ac.jp)