From Forest Nursery Notes, Summer 2007

131. © Nursery soil cover influences germination of *Thujopsis dolabrata* var. *hondai* seeds. Yamaji, K. and Mori, S. Journal of Forest Research 11:467-470. 2006.

J For Res (2006) 11:467–470
DOI 10.1007/s10310-006-0241-8

SHORT COMMUNICATION

Keiko Yamaji · Shigeta Mori

Nursery soil cover influences germination of *Thujopsis dolabrata* var. *hondai* seeds

Received: February 28, 2006 / Accepted: September 4, 2006

Abstract We examined the influence of nursery soil cover on germination of *Thujopsis dolabrata* var. *hondai*. Seeds were sown under seeding bed conditions: (1) nursery soil (andosol) without soil cover, (2) Kanuma pumice without soil cover, (3) nursery soil with nursery soil cover, and (4) nursery soil with sterilized sand cover. Germination percentages were compared between these conditions. The germination percentage (8.8%) at 10 weeks after sowing under condition 3 was significantly lower than under conditions 1, 2, and 4 (56.8%, 52.0%, and 47.2%, respectively). Of the nongerminated seeds under condition 3, 75.0% were decayed and several fungi were isolated from decayed seeds. An inoculation test of isolated fungi *Cylindrocarpon tenue*, *Cylindrocarpon* sp., *Fusarium oxysporum*, and *Botrytis* sp. to seeds showed that these fungi caused seed decay. Our results indicated that nursery soil cover may not be suitable for *T. dolabrata* var. *hondai* seeds sown in nursery soil because of seed decay by pathogens.

Key words Seed decay · Germination percentage · *Thujopsis dolabrata* var. *hondai* · Soil covering

Introduction

Hinoki-asunaro (*Thujopsis dolabrata* Sieb. et Zucc. var. *hondai* Makino), also called hiba or ate, is a tree species indigenous to Japan with distribution from Oshima Peninsula (42°10′ N) in Hokkaido to Tochigi Prefecture (36°47′ N) in Honshu (Kobayashi and Asakawa 1981). The trunk and branches contain characteristic secondary metabolites and the wood shows high decay durability, which make it an important commercial tree species in Japan.

Because of slow growth, several nursing systems for *T. dolabrata* var. *hondai* have been developed (Sakurai and Mori 1985a, b; Itoya and Shimoda 1995; Ito 1997, 2000; Mori et al. 2003; Aomori Forestry Research Institute 2004). Humic nursery soil (andosol) is generally used for *T. dolabrata* var. *hondai* seeding beds and the seeds are covered with nursery soil to avoid seed drifting (Aomori Forestry Research Institute 2004). Seeds covered with nursery soil gradually germinate and the germination percentage at 100 days after sowing is significantly lower than seeds not covered by nursery soil (Itoya and Shimoda 1995). In naturally regenerated forests, *T. dolabrata* var. *hondai* seedlings grow in mineral soil without humus. Kanuma pumice is used as a model mineral soil for seeding beds (Mori et al. 2003). The germination percentage in Kanuma pumice without soil cover is markedly higher than that in nursery soil (Mori et al. 2003). However, the cause of the disadvantages of a nursery soil cover for *T. dolabrata* var. *hondai* germination is not clear.

To understand the influence of nursery soil cover on germination, this study compared germination percentages under four conditions. When the germination percentage was low, seeds were examined to determine the reason for nongermination, which, on frequent occasions, was seed decay.

Materials and methods

Seeds and soil

Thujopsis dolabrata var. *hondai* seeds were randomly collected from approximately 20 trees in natural forests in Nakasato, Aomori Prefecture, northern Honshu, Japan (40°58′ N, 140°28′ E), in October 2003. Seeds were kept at 4°C in a paper bag until used. Full seeds selected by using soft X-rays (CMBW-2, Softex, Tokyo, Japan) were used for

K. Yamaji[1] (✉)
Research Fellow of the Japan Society for the Promotion of Science

S. Mori
Tohoku Research Center, Forestry and Forest Product Research Institute, Morioka, Japan

Present address:
[1]Biosphere Resource Science and Technology, Graduate School of Life and Environmental Sciences, University of Tsukuba, 1-1-1 Tennoudai, Tsukuba 305-8572, Japan
Tel. +81-29-853-7202; Fax +81-29-853-7202
e-mail: yamajik@sakura.cc.tsukuba.ac.jp