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A Research Project to Develop Strategic Action Plan in the Pine-wilt-disease Unaffected Area in Northern Japan

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Aomori is the northernmost prefecture in Honshu, the main island of Japan, that had not been affected by pine wilt disease (PWD). To develop an action plan to prevent from and be prepared for introduction of PWD into Aomori Prefecture, we tried to acquire critical information related to introduction, colonization and spread of the disease from the view point of presence/absence of the insect vectors and competitive substitution of *Bursaphelenchus* nematodes, as well as the tolerance of tree populations and forest communities to the loss of pine trees resulted form the disease.

Captures of adult *Monochamus alternatus* by attraction traps and genetical identification of the trapped adult using SSR markers indicated that accidental incoming of the vector insect occurred at the south-west border to the neighboring prefecture having severely damaged forests by PWD, but was effectively checked by the 2-km clear-cut zone of pine trees.

According to the whole tree investigations for subcortical insects in 124 dying and newly dead pine trees conducted in various locations in Aomori, it seemed that neither *M. alternatus* nor *B. mucronatus*, as substitutive species for *B. xylophilus*, was distributed in the prefecture.

The old-growth population of *Pinus densiflora* did not compensate the loss of forest canopy caused by PWD, and the broad-leaved trees mixed in *P. densiflora* or *P. thunbergii* dominated forests could not substitute the status and functions of pine trees in the original forests. Thus we concluded that the loss of pine trees by PWD epidemic would bring about severe degradation of the forests in the area.

On the basis of the irreplaceableness of the pine species in the forests, absence of effective vector and substitutive species of *B. xylophilus*, and limited entry route of the disease into the prefecture, we proposed regionally-specialized action plan against PWD in Aomori Prefecture.