(111) Growth properties of pine trees died from pine wilt disease

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ABSTRACT

Are there any traits in appearance of dead trees in the early stage of massive pine death caused by pine wilt disease? In other words, what is the landmark for *Monochamus* species as a vector choosing pine trees for after-ripening? The study was conducted in *P. thunbergii* community of Amonohashidate, Kyoto, Japan. Pine trees with larger diameter were easy to die in comparison with those with smaller diameter. Trees with larger diameter seem to have a larger tree crown. This might show that *Monochamus alternatus* can easily access to pine trees with a larger crown and do not come flying to declined pine trees.

INTRODUCTION

What is the landmark to *Monochamus* species as a vector choosing pine trees for after-ripening? Researchers on pine wilt disease almost certainly know this. It is important to know to which pine tree *Monochamus* comes flying in order to manage control programs. This study tried to evaluate a relationship between tree growth properties such as tree height and diameter at breast height (dbh) and pine death caused by pine wilt disease.

STUDY AREA

The study was conducted in *P. thunbergii* community of Amanohashidate, Kyoto, Japan (35°34'N, 135°11'E). Amanohashidate has been best known for its coastline of white sands in Japan. Death of pine tree is of crucial significant to its landscape maintenance. The pine community of Amanohashidate does not connect with the pine forests of surrounding mountainous area and is on a flatland.

TESTED TREES AND ANALYSIS

1. Tree height and dbh: 36 pine trees died in 2002 and 154 live pine trees surrounded dead pines were selected in September 2003. Relationship between dead or not in pine trees as objective variables, and height or dbh of pine trees as explaining variables was analyzed using the Generalized Linear Mixed Model (GLMM). Tree height and dbh have been measured in March 2002.
2. Annual ring analysis: 5 dead pine trees and 10 live pine trees selected among above pine trees were selected. Width of annual ring on increment core collected by an increment borer was measured.

RESULTS AND DISCUSSION

1. Tree height and dbh: There was significant correlation between death and dbh ($p=0.06$, RIV=0.78). This shows that pine trees with larger diameter were easy to die in comparison with those with smaller diameter. *M. alternatus* just after emerging makes choice of healthy pine tree in random manner and then feeds younger shoots (Togashi 2006). *M. alternatus* can easily access to pine trees with a larger crown because of larger target.
2. Annual ring analysis: In both dead pines and live pines the width of annual ring in 2001 was narrower than that in 2000. This seems to be due to low rainfall in early summer of 2001. Dead pine trees did not suffer severe stresses as live pine trees. That's not to say that *M. alternatus* did not target at declined trees for after- ripening.

CONCLUSION

M. alternatus can easily access to pine trees with a larger tree and do not come flying to declined pine trees.

REFERENCES

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