

## High risk ambrosia beetles species attacking living trees

Sunisa Sanguansub<sup>a</sup>, Hideaki Goto<sup>b</sup>, and Naoto Kamata<sup>c</sup>

<sup>a</sup> Department of Entomology, Kasetsart University, Kamphaeng Saen Campus, THAILAND

<sup>b</sup> Kyushu Research Center, Forestry and Forest Products Research Institute, JAPAN

<sup>c</sup> The University of Tokyo Chichibu Forest, JAPAN

An unexpected introduction of ambrosia beetles to non-indigenous area has been increasing because of globalization. Some of them have become major components of ambrosia beetle fauna in non-indigenous areas and caused decline of some native species. Some ambrosia beetles species are aggressive enough to attack living trees, which have a high risk of killing living trees by symbiotic fungi. Here, we studied the ecological niche of ambrosia beetles attacking on an oak (*Quercus serrata*) tree and evaluated a risk attacking living trees. Freshly cut *Q. serrata* bolts were set on forest floor in three locations in Japan. Three niche contexts: timing of cutting tree, timing of starting exposure, and wood oldness of bolts were artificially controlled by covering with metal mesh. The number of entry holes was used as an indicator for abundance of each species. Twenty four species of ambrosia beetles were collected. Niche center and niche breadth were evaluated for the three niche contexts. Our results showed that *Xyleborus seiryorensis* and *Platypus quercivorus* had a high risk of attacking living trees because of high preference to fresh wood (= small niche center of wood oldness). Actually, in Japan, *P. quercivorus* attacks and kills healthy living oak trees by carrying a pathogenic fungus *Raffaelea quercivora*. *Xyleborus laetus* and *Crossotarsus simplex* showed small niche center of wood oldness though the abundance was small. *Xyleborus ganshoensis* was also likely to attack living trees because of its broad niche of wood oldness covering fresh wood. In our experiment, *Xylosandrus crassiusculus* and *Xyleborus germanus*, which were known to attack and kill living trees, did not show strong preferences to fresh wood. It is likely that these secondary ambrosia beetles become aggressive enough to attack healthy trees during high density periods as reported for some secondary bark beetles. The method used in our reaserch seems to be available to evaluate risk of ambrosia beetles attacking living trees of other species, which will be useful to assess a risk of killing trees.

Corresponding Author:

Sunisa Sanguansub

Department of Entomology, Faculty of Agriculture at Kamphaeng Saen

Kasetsart University, Kamphaeng Saen Campus

Kamphaeng Saen District, Nakhon Pathom, 73140, Thailand

e-mail: tooisop@gmail.com