Robinia pseudoacacia as a surrogate for native tree species for saproxylic beetles inhabiting the riparian mixed forests of northern Italy

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Abstract

1 The felling and leaving of non-native trees comprise management strategies designed to increase dead wood for saproxylic fauna in forests without affecting native tree species. In northern Italy, the most widespread exotic tree in alluvial forests is the North American Robinia pseudoacacia.

2 We quantified the difference in species composition and abundance among saproxylic beetles of two European broad-leaved trees, Populus alba and Quercus robur, and the exotic broad-leaved tree Robinia pseudoacacia.

3 We collected beetles emerging from 29 fallen trunks with a diameter of between 29 and 31 cm and belonging to the second decomposition stage.

4 We identified 249 individuals from 25 saproxylic beetle species. Species richness and composition did not differ among tree species. Although permutational multivariate analysis of variance highlighted significant differences in species composition, linear mixed effect models showed that differences depend exclusively on spatial distances between logs and not on the host tree species. The Morisita-Horn index and principal coordinate analysis confirmed this pattern.

5 Thus, we found that saproxylic beetles use all dead trees available in the forest, without distinguishing between exotic or native trees but only occupying the nearest ones. From a forest management point of view, this supports the practice of leaving dead wood of exotic trees at restorations for saproxylic beetles.