

Question: How does fungal damage attract beetles?

Beetles and fungal pathogens live in a symbiotic relationship. Fungal damage provides food for beetles, modifies the substrate (softens the wood) and emits aromatic compounds that attract beetles. Beetles in turn vector, meaning spread, the pathogen. The following papers address how fungal damage attracts beetles:

The sudden emergence of pathogenicity in insect-fungus symbioses threatens naïve forest ecosystems. Hulcr, J, and Dunn, R. Proc. R. Soc. B 2011 278:2866-2873.

*Description: "In recent decades, many symbiotic insects and fungi have been introduced ... and these fungus-insect couples are much more destructive, attacking living, not just dead and dying trees"*

<https://www.ncbi.nlm.nih.gov/pubmed/21752822>

Bark Beetle, Fungus, and Host Interactions Involved in the Death of Pines in California, David L. Wood, Western Forest Insect Work Conference, 1993

*Description: "He describes the role of fungus and bark beetles involved in the Death of Pines in California"*

<http://wfiwc.org/awards/speeches/wood>

Nutritional and pathogenic fungi associated with the pine engraver beetle. Villari, C. Battisti, A, Chakraborty, S, Michelozzi, M., et al. Tree Physiology. 2012. 32(7):867-879.

*Description: "some fungal species serve as bark beetle larvae food, while others may participate in depleting the host plant's defenses"*

<https://www.ncbi.nlm.nih.gov/pubmed/22718525>

Bark beetles and associated species with high heavy metal tolerance. Heliövaara, K, Vaisanen R, Journal of Applied Entomology 1991. 11(1-5).

*Description: "bark beetles and fungi are tolerant to high levels of aluminum"*

<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1439-0418.1991.tb00340.x>

Volatile Organic Compounds Emitted by Fungal Associates of Conifer Bark Beetles and their Potential in Bark Beetle Control, Kandasamy D, Gershenson J, Hammerbacher A; Journal of Chemical Ecology, 2016

*Description: "This paper discusses the aromatic compounds that might be attracting bark beetles."*

<https://www.ncbi.nlm.nih.gov/pubmed/27687998>