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**Factors affecting outbreaks of Heterobasidion on conifers and broad-leaves in the area of the Serre Calabresi**

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## Factors affecting outbreaks of *Heterobasidion* on conifers and broad-leaves in the area of the Serre Calabresi

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The genus *Heterobasidion* includes some of the most harmful pathogens of conifers worldwide. In the last decades, in Calabria, the fungus has been found with increasing frequencies on silver fir (*Abies alba*), but also on broadleaves, elsewhere rarely affected. The purpose of this work was to identify the fungus associated with different tree species at the species level, and to monitor the evolution of outbreaks over time in relation to climatic trends and forest tree species composition. Based on the outcomes of TSCPPCR assays, *Heterobasidion abietinum* Niemelä & Korhonen was found exclusively on silver fir, while *Heterobasidion annosum* (Fr.) Bref. was found on beech (*Fagus sylvatica*), black pine (*Pinus nigra* laricio) and Douglas fir (*Pseudotsuga menziesii*). The greatest damages were detected on silver fir and beech, while they were occasional on Douglas fir and rare on pine. Based on the monitoring of silver fir and beech every six months in three different areas over a ten year period, disease severity appeared affected by rainfall, with an increase in the decline of trees after periods of severe drought and a slowdown with well-distributed rainfall during the year. Outbreaks were strongly slowed down in mixed forests in relation to an increase in the presence of nonsusceptible species. Outbreaks of *Heterobasidion* in Calabria might be linked to climate change leading to long periods of drought in the last decades, and affecting especially tree species at the edge of their natural range. Tree species diversity is expected to minimize the risk of outbreaks.