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ABSTRACT SUBMISSION FORM

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PINUS YUNNANENSIS RESISTANCE TO A BARK BEETLE ASSOCIATED FUNGUS IS INCREASED BY A NATURAL WATER STRESS.

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Two neighboring sites of an area forested with Yunnan pine (*Pinus yunnanensis*), located in Yunnan province (China) and clearly differing by their water availability, were compared for tree resistance to isolated and mass artificial inoculations with *Leptographium yunnanense*, a fungus associated with the bark beetle *Tomicus* sp. During 18 months alternating dry and humid seasons in each site, trees' physiological parameters (soil water content at different depths, predawn needle water potential, needle water content) were followed in the two sites. Simultaneously, the performances of the fungus after isolated inoculation (growth in the phloem, ability to induce the development of a phloem induced reaction) and its virulence after mass inoculations were periodically measured to appreciate tree resistance. The phloem induced reactions were more extended during the wet than during the dry season, and fungus grew further into the phloem during the humid season and in the wet site than during the dry season and in the dry site. Fungus virulence after mass inoculations was higher during the humid period and in the wet site than during the dry period and in the dry site. These results demonstrate that tree resistance to fungus inoculation and consequently to bark beetle attacks, is increased by a mild water stress. This is in agreement with the growth-differentiation balance hypothesis and with the idea that the fungus is favored by a large availability of water. In conclusion, drought is not a general explanation for *Tomicus* damage in Yunnan.

Abstract Title PINUS YUNNANENSIS NATURAL RESISTANCE TO A BARK BEETLE ASSOCIATED FUNGUS IS INCREASED BY A MILD WATER STRESS.

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