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THE EFFECTS OF FUNGAL ENDOPHYTES ON PHYSIOLOGICAL AND MORPHOLOGICAL TRAITS IN *PICEA GLAUCA*

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Picea glauca or white spruce is a common Canadian conifer with great economic importance. Unfortunately, insect pests such as the spruce budworm attack it on a regular basis, causing detrimental effects on the species and the economy. One environmentally friendly way to combat these pests is by using fungal endophytes. Endophytes are microscopic organisms that live within plants and can cause an array of positive and/or negative effects. Fungal endophytes can also produce



substances with anti-herbivory characteristics, which can provide protection from insect pests. With that said, it is important to understand the interactions between fungal endophytes and white spruce before we can use the endophytes as a safe solution to the insect pest problem. My study examined the effects of three fungal endophyte strains on photosynthesis, the rate of gas exchange between the leaf (needle) and the environment, and growth rates of white spruce. Young, infected (with an endophyte) and non-infected white spruce trees were used for photosynthesis and transpiration (rate of water loss) measurements. These trees were also used for height and stem volume measurements as well as needle length and width measurements. One of the endophytes strains increased stem volume and needle width. The same strain also increased transpiration, suggesting an effect on stomatal function. Surprisingly, none of the endophytes used had a significant effect on photosynthesis. These results, combined with entomological data, can be useful in determining which white spruce varieties and endophyte strains are most suitable for use in the forest industry.

Loay Jabre graduated from a small high school in the British Virgin Islands in 2008. He then graduated from H. Lavity Stoutt Community College with an Associate degree in Natural Science in 2010. He is currently completing his Honours thesis in his 3rd year in Biology at Acadia. While at Acadia, Loay received the Dr. Francis M. Archibald scholarship and the Dr. Muriel V. Roscoe Memorial Scholarship in Biology. He is an avid photographer and a volunteer firefighter in the Wolfville Fire Department. Loay will be pursuing his Master's in Entomology at Acadia in the next academic year, and hopes to become a biology professor in the future.

