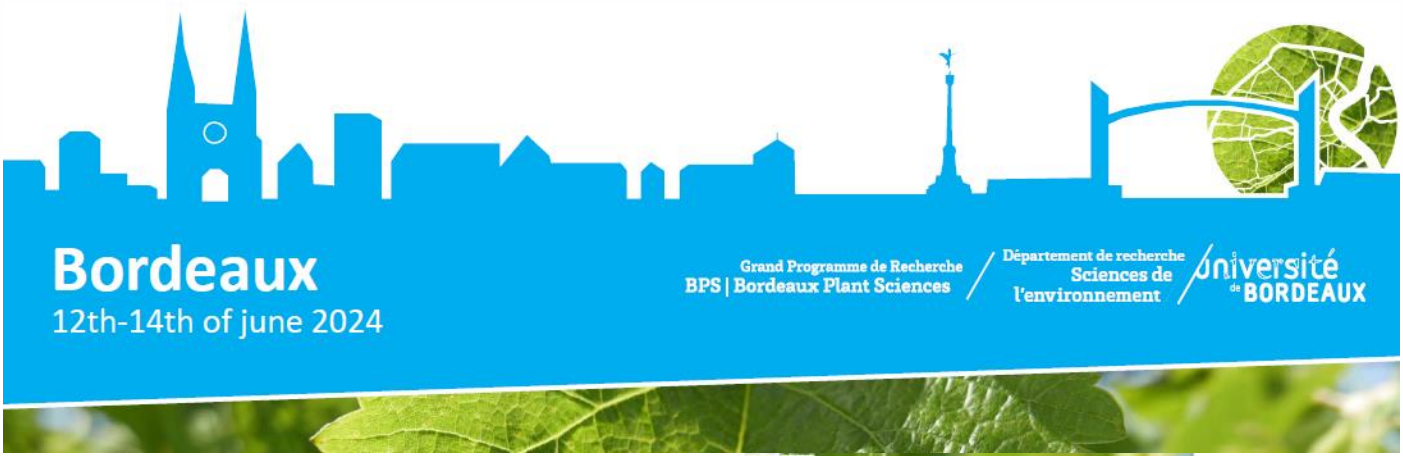
14th International Congres of the French Society of Plant Biology

ABSTRACT BOOK



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Introduction

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Silicon Transporter Genes in Vitis ssp.: Implications for Plant Resistance to Biotic and Abiotic Stresses

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In this study, we uncover the crucial influence of silicon. Silicon plays a pivotal role as an essential nutrient for the optimal growth and sustainable production of higher plants. Its accumulation in plant shoots acts as a protective mechanism against various abiotic and biotic stresses, especially when levels exceed 10%. Our first observations on grapevines revealed the positive effects of silicon in the fertilization of young grafted-welded plants. Treated plants exhibited notable improvements in growth, resistance, structural integrity, and leaf pigmentation compared to untreated plants. Based on these findings, we hypothesized a positive impact of silicon on overall plant physiology. According to existing literature, two genes involved in silicon transport have been identified in grapevines VviLSI1 (NIP 2;1 Aquaporin) and VviLSI2 (Lsi2-like transporter), localized in stems and roots. We present here our work and our first results on the characterization of Lsi genes in grapevine.

We employed gain and loss of function strategies to investigate LSI functions exploiting vectors for the overexpression and knock-out (with CRISPR/Cas9 system) of the candidate gene. Our preliminary results indicate that optimizing the plant's ability to assimilate and utilize silicon could strengthen its defenses against both biotic and abiotic stresses, such as pathogenic fungi and water deficit.