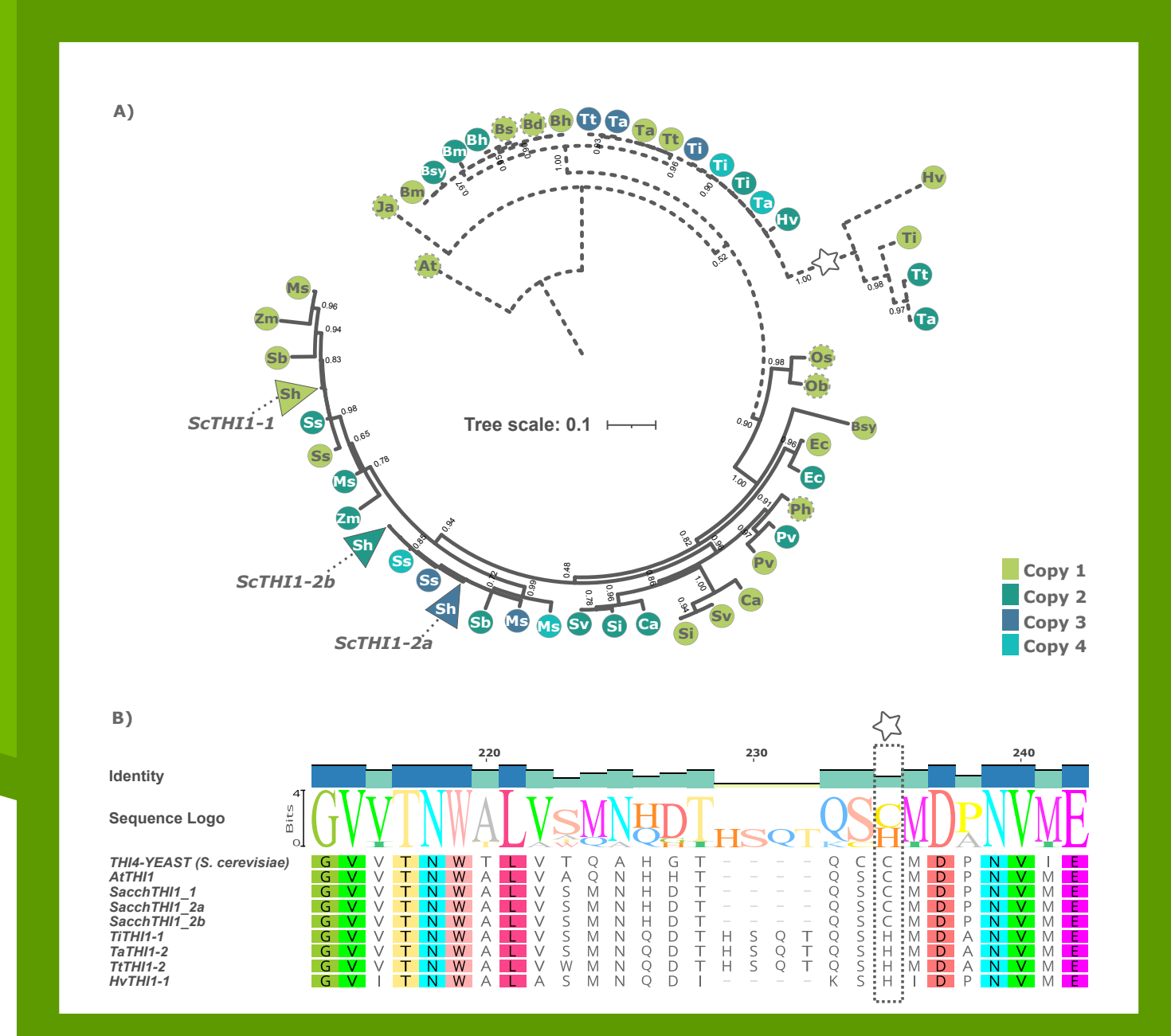


# Functional and comparative analysis of THI1 gene

IN GRASSES WITH A FOCUS ON SUGARCANE

## INTRODUCTION

Our study investigates an essential gene involved in vitamin B1 synthesis found in plants and fungi but not in animals; we must intake it. Thiamine (vitamin B1) is essential to several metabolic pathways common to living organisms be it a single cell or a multicellular organism.



RICE



MAIZE



WHEAT

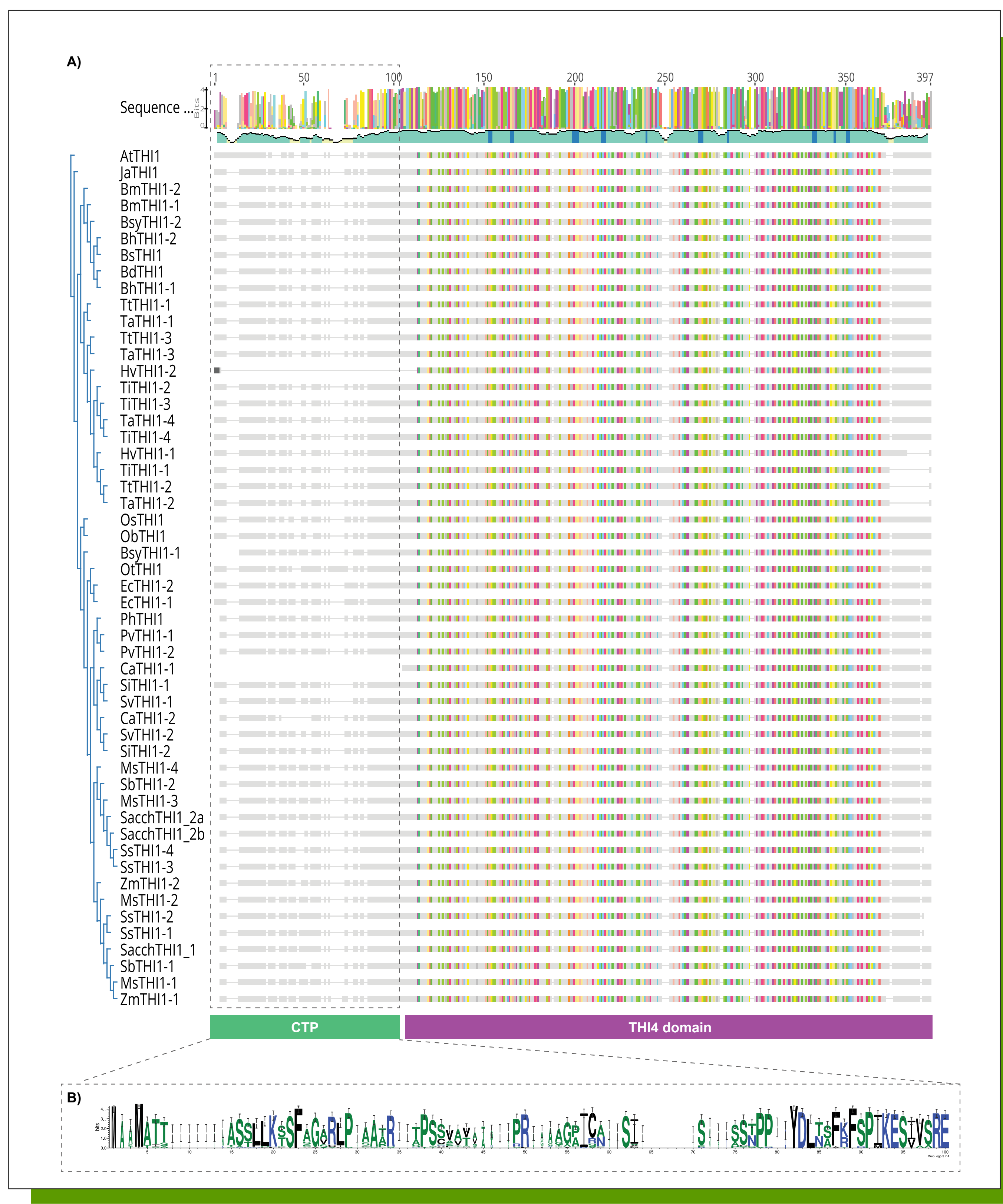


SUGARCANE

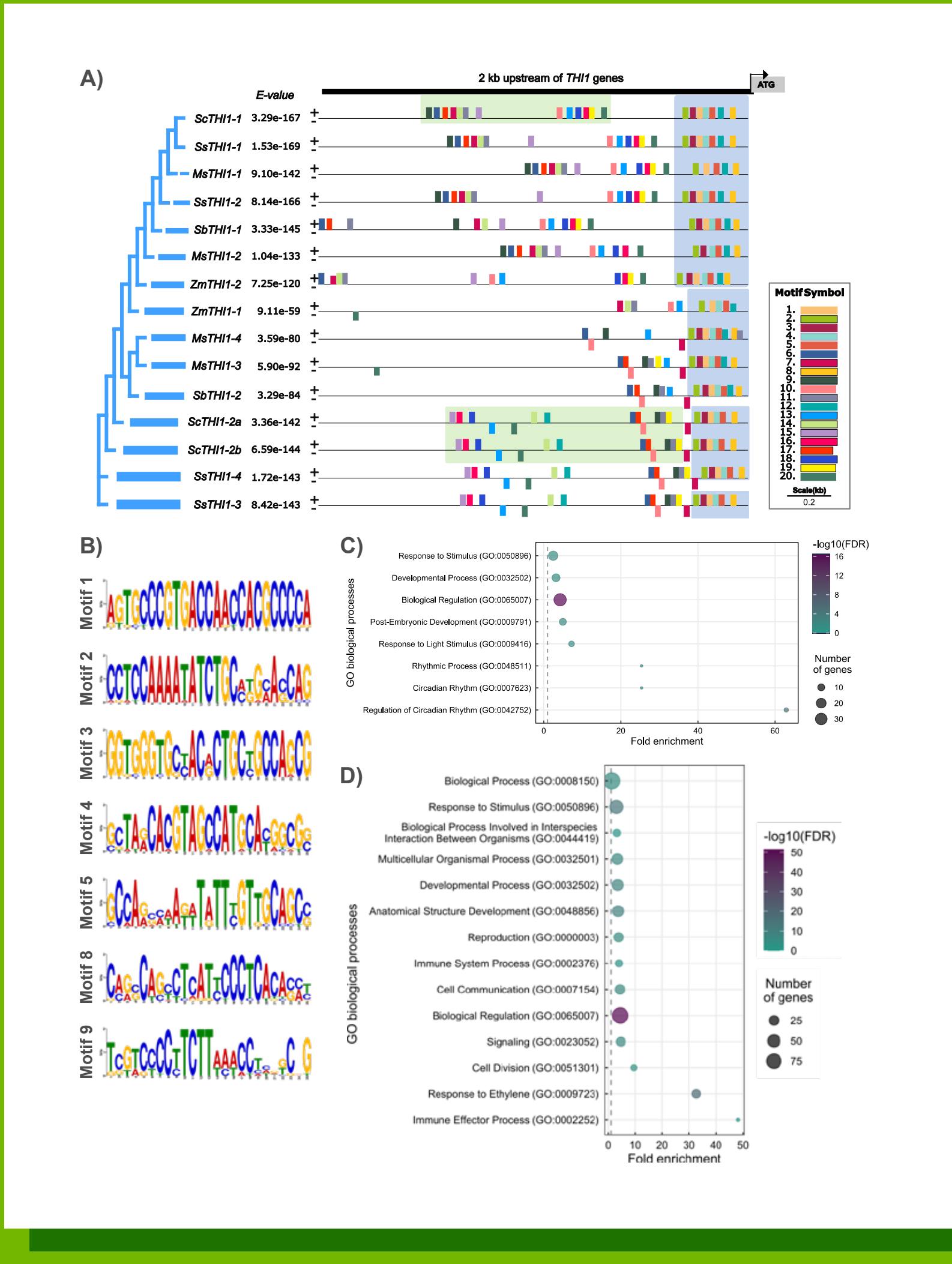
**THI1 the gene studied shares several features among maize, rice, wheat, sugarcane, and other Poaceae.**

Results provided the first complete overview of THI1 in Poaceae, including protein characterization, phylogeny, gene structure, chromosome location, synteny, and gene expression patterns.

The research suggests the existence of distinct genomic environments of THI1 with functional redundancy in Poaceae and raises questions about the role of the THI1 protein in C3 and C4 photosynthetic plants.



## CONCLUSION



Taken together, the study of the sugarcane THI1 supports the existence of independent rounds of gene duplication events involving THI1 orthologs. Each tribe has a unique genomic THI1 environment except for maize, whose two gene copies share the same environment. Expression of sugarcane THI1 is redundant across tissues and in developmental stages where leaves have a higher expression level and roots the least. This is consistent with the similarity observed at the core promoter of the paralog genes.