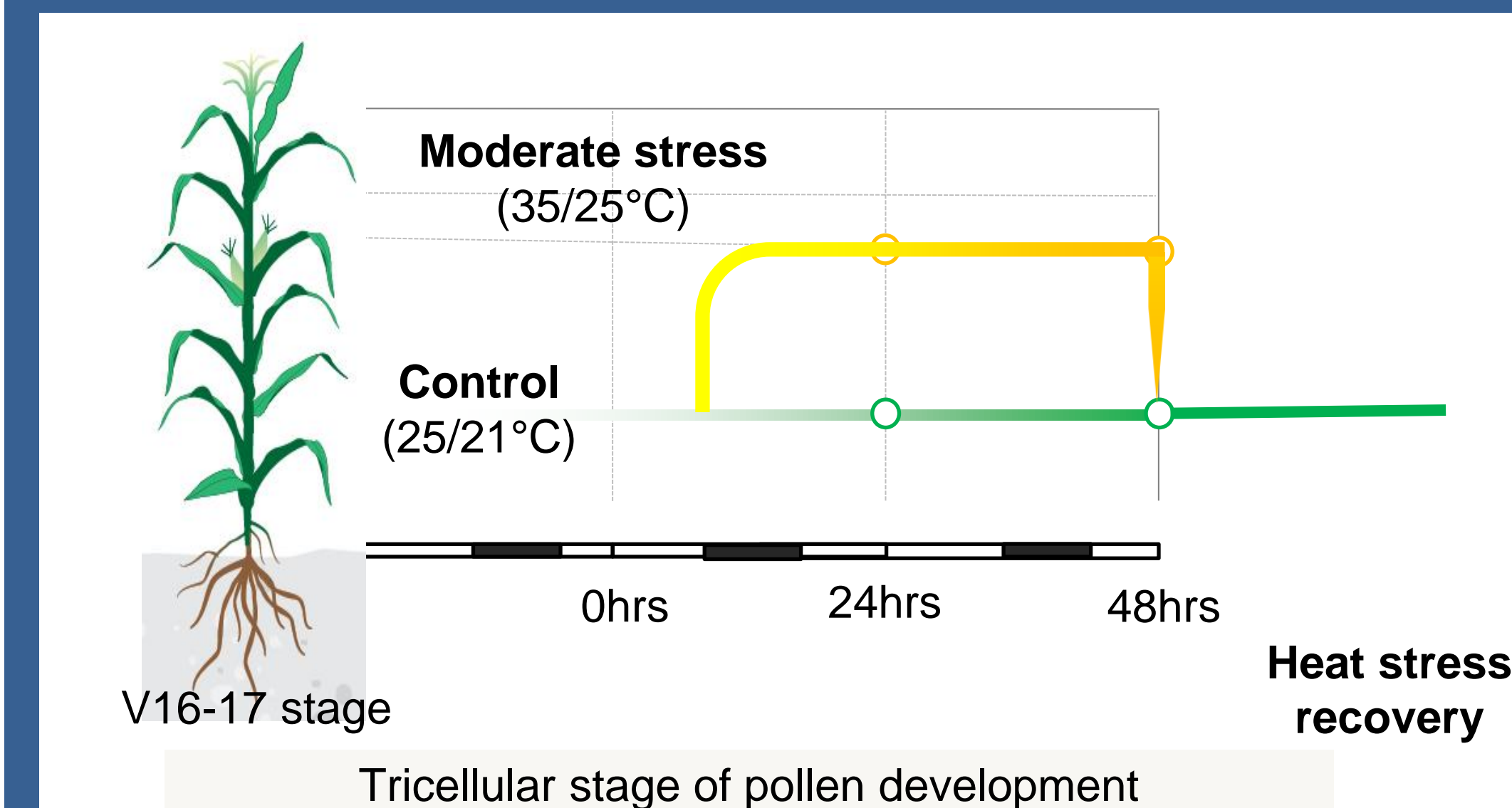


Introduction

Environmental conditions have significant influence on the development of plants. Extreme conditions, in particular heat stress, have substantial effects in crop plants, especially during critical stages of development, for example at germination and reproduction. Recently, cases of heat stress affecting crops at critical plant developmental stages have increased in many regions of the world. With expanding demand of food, there is an urgency to understand plant response to stressful conditions with the aim of developing crop plants resilient to environmental stresses. Therefore, the main objective of this research was to evaluate the effect of heat stress at the late stages of maize pollen development.

Materials and Methods



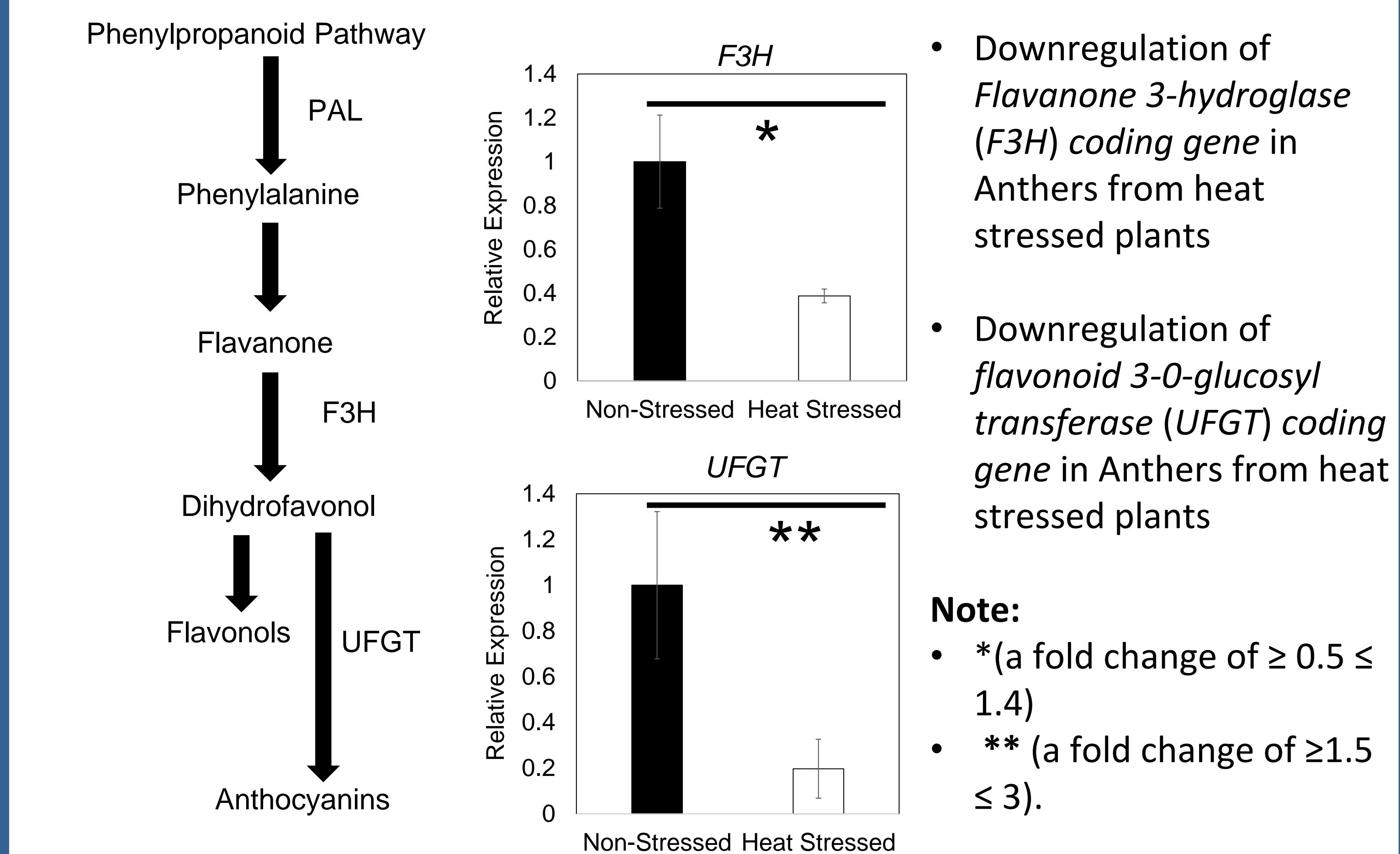
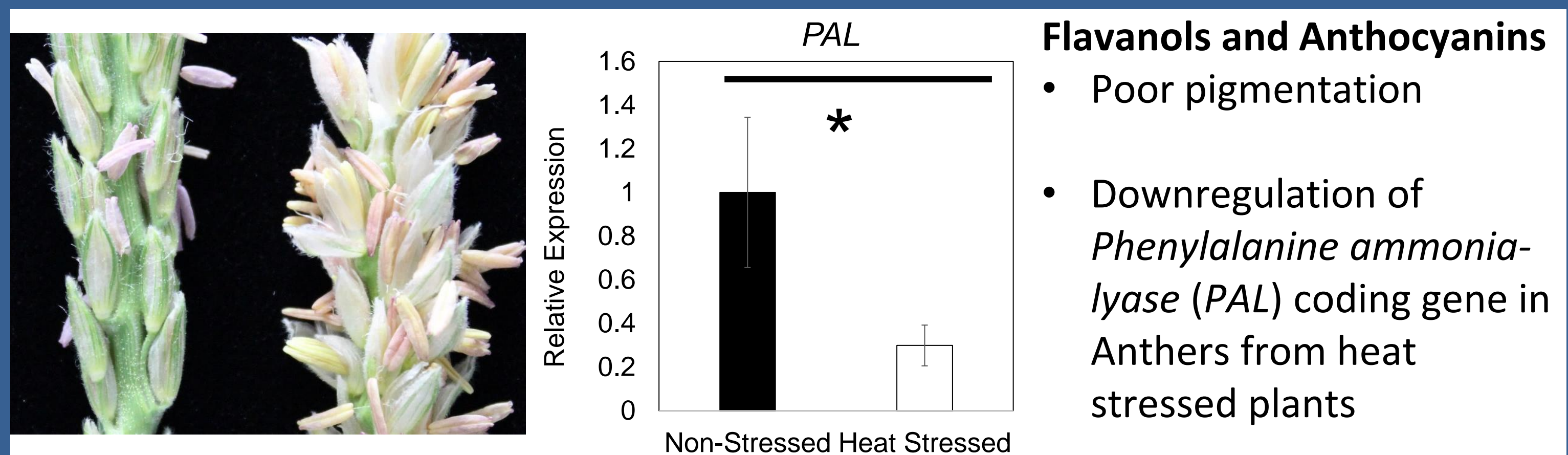
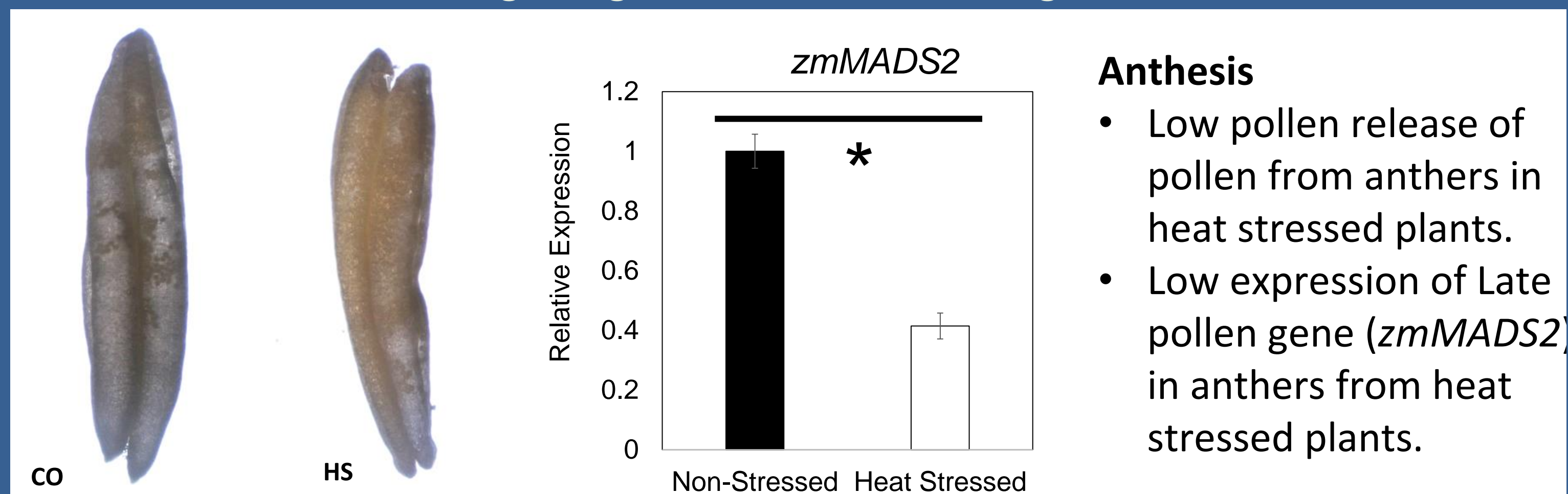
Procedure:

- B73 Maize plants
- HS-35/25°C, day/night, respectively
- CO-25/21°C, day/night, respectively)
- Stress period 48 hrs
- Recovery 24 hrs

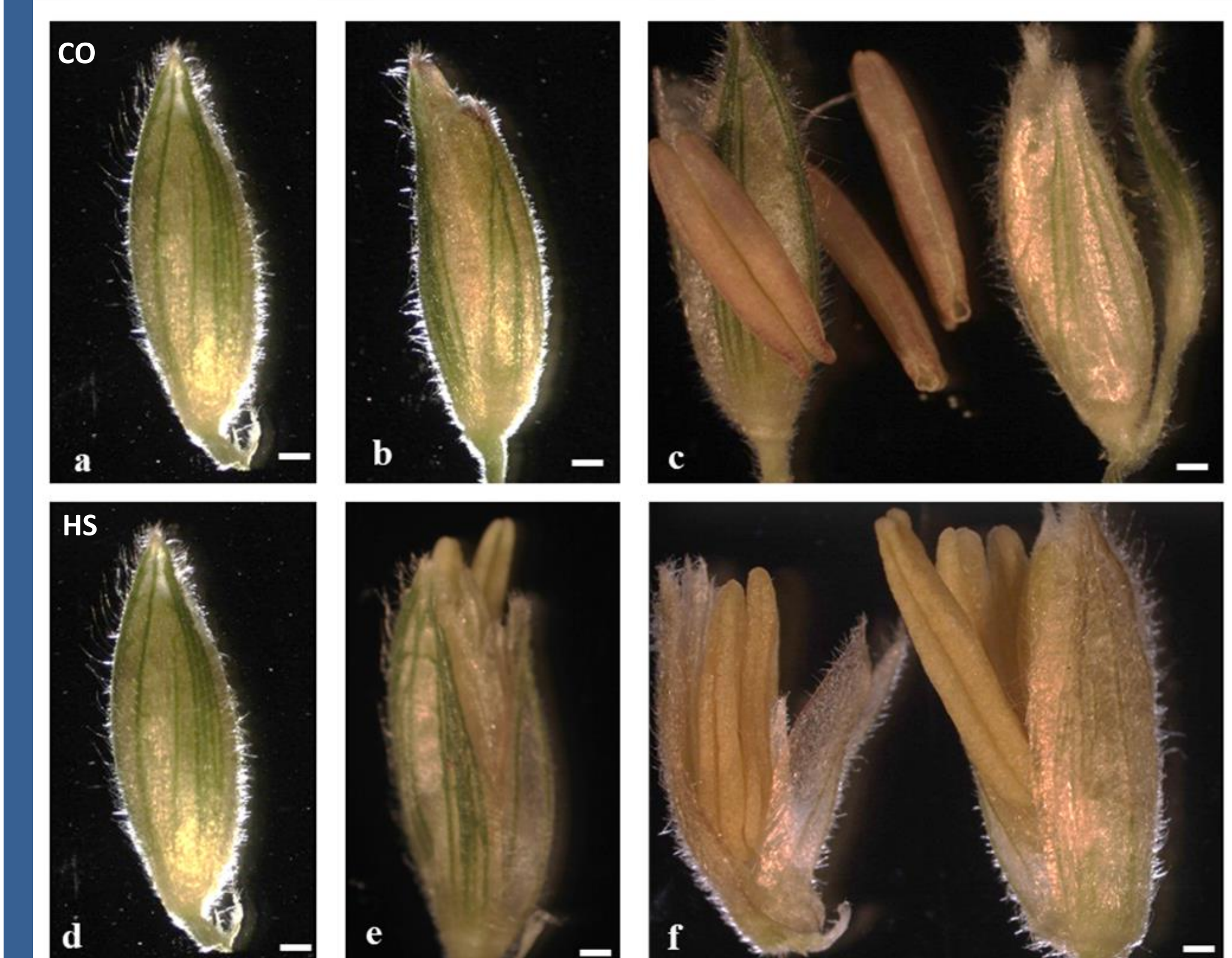
Data:

- Leaves, florets, anthers & pollen
- Phenotype, RT-qPCR
- RT-qPCR data- $\Delta\Delta$ CT method

Molecular Signaling in Maize Anther During Maturation



Results

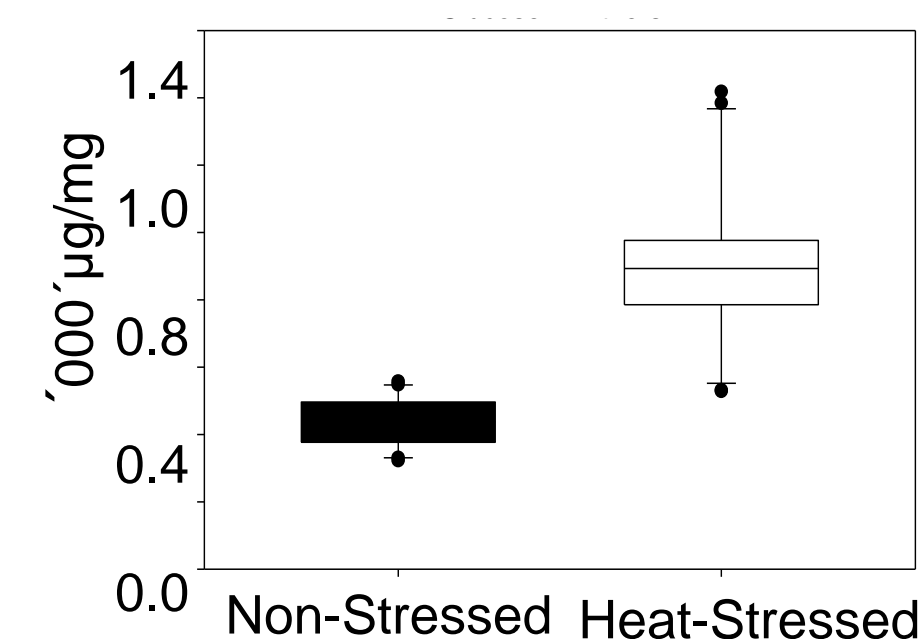


Anther Phenotype at 48 hrs

(a&d- 0 hrs, b&e-24 hrs, c&f- 48 hrs)

- Dull dry anthers observed in heat stressed plants versus control plants
- Shrinkage of anthers in florets observed in heat stressed plants versus control plants
- Anthers in control plants, open to release pollen while anthers in heat stressed plants remain closed.

Glucose in Anthers



Variation in starch metabolism in anthers from heat stressed versus non stressed plants.

Conclusions

- Heat stress at tricellular stage of maize pollen development impaired gene expression, as well as primary & secondary metabolism affecting anther dehiscence.
- Secondary metabolism in anther maturation & dehiscence needs further evaluation.