

24<sup>th</sup>  
INTERNATIONAL  
**Pepper**  
CONFERENCE

November 4-6, 2018 | Fort Myers, Florida

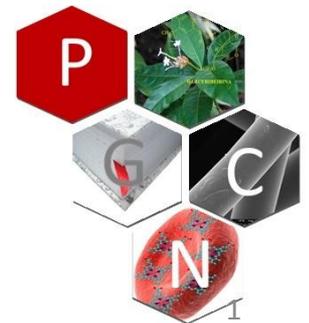
# MACRONUTRIENT MINERAL CONTENT OF *Capsicum annuum* FRUITS FROM GENOTYPES RESISTANT AND SUSCEPTIBLE TO *Xanthomonas euvesicatoria*

*Sthefanny de Almeida Neto*, Aminthia Pombo Sudré,  
*Sergio Luis Cardoso, Rosana Rodrigues*



**UENF**

Universidade Estadual do  
Norte Fluminense Darcy Ribeiro



# Introduction

## Why Chili Peppers?



# Introduction

- Commercial importance:



- Traditional medicine: Antimicrobial, insecticidal, anticonvulsive and sedative functions.



# Introduction

Chili peppers fruits:

- high vitamin values
- are sources of ascorbic acid,
- carotenoids (capsanthin, capsorubin...),
- tocopherols (Vitamin E),
- flavonoids,
- capsaicinoids (capsaicin, dihydrocapsaicin...)



# Introduction

Importance of the mineral profile?

- defense mechanisms;
- increasing or decreasing the resistance of plants to pathogens.



# Introduction

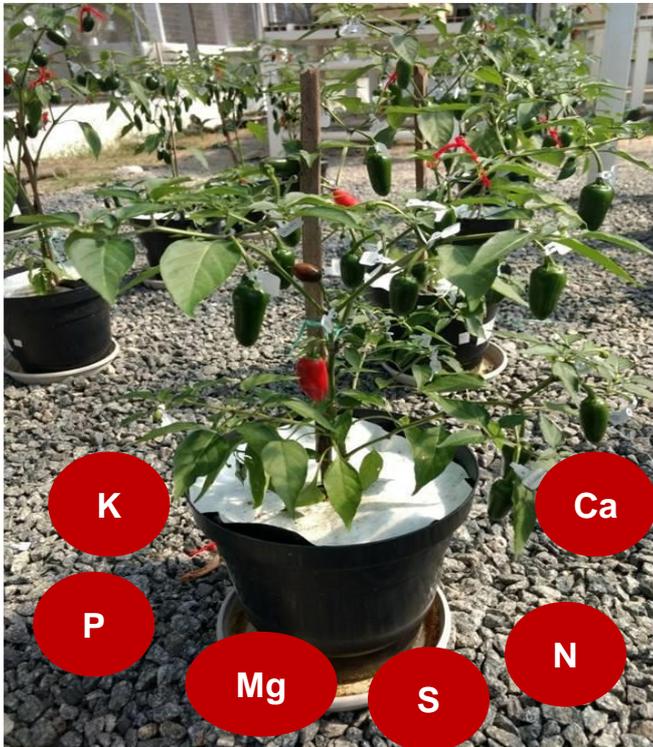
The Mineral profile is influenced by:

- Nutrition
- Genotypes
- Stage of maturation
- Cultivation techniques



# Introduction

- Nutrition:

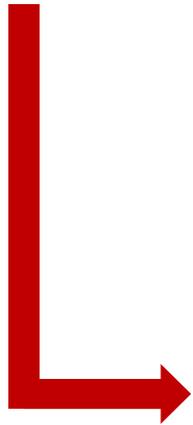


Minerals are essential for various metabolic functions of the plant.



# Introduction

- Genotype;
- Stage of maturation



Biochemical, physiological and structural changes that occur during fruit maturation, such changes determine the attributes of fruit quality.

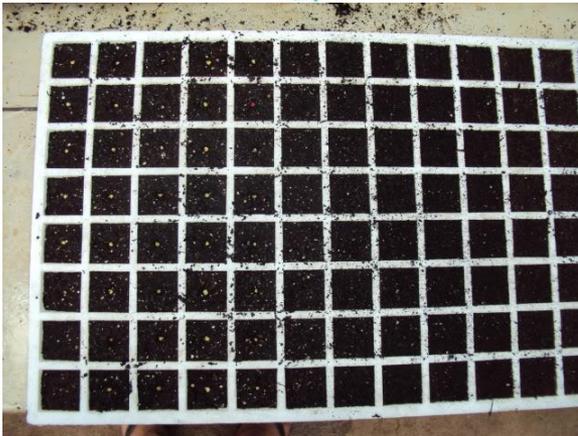


# Aim

Work aimed to determine the macronutrient mineral content of *Capsicum annuum* fruits from resistant (UENF1381) and susceptible (L11) to *X. euvesicatoria*, one of the pathogens involved in the bacterial spot disease.



# Methodology



# Methodology

Hoagland solution



every three days

Two treatments

a) resistant UENF 1381

b) susceptible L11 to *X. euvesicatoria*.



# Methodology



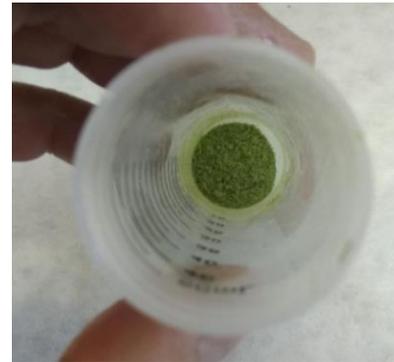
The fruits were collected at 30 and 40 days after the anthesis (DAA)

the flowers are marked in the anthesis

The fruits were separated into two parts (pericarp and seeds with placenta) and then kept frozen in a freezer at -20 °C



# Methodology



each fruit part was lyophilized

- K
- P
- Mg
- S
- Ca



ICP-OES

macerated with liquid nitrogen

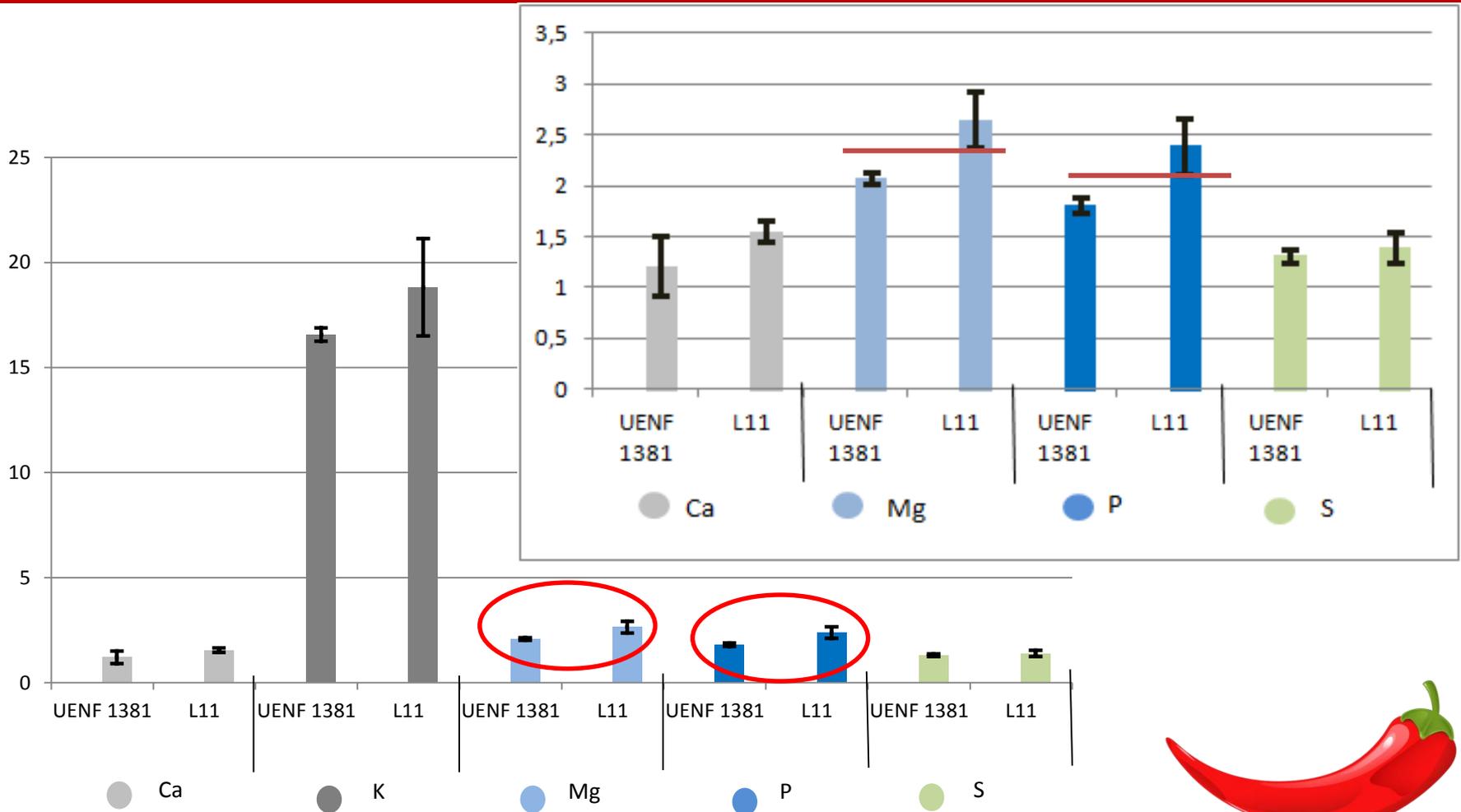


digested in nitric acid



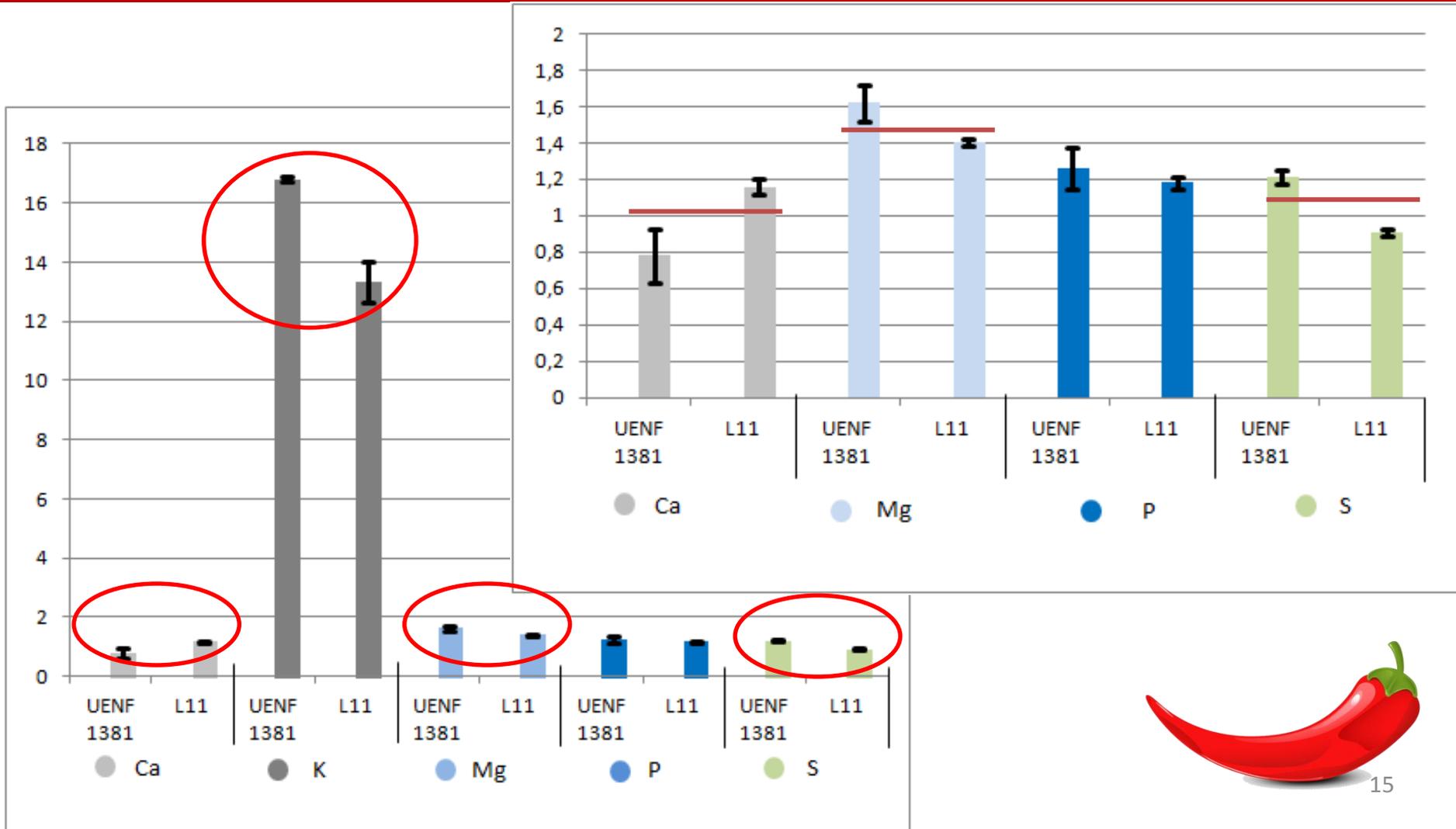
# Results

Pericarp 30 days after the anthesis (DAA)



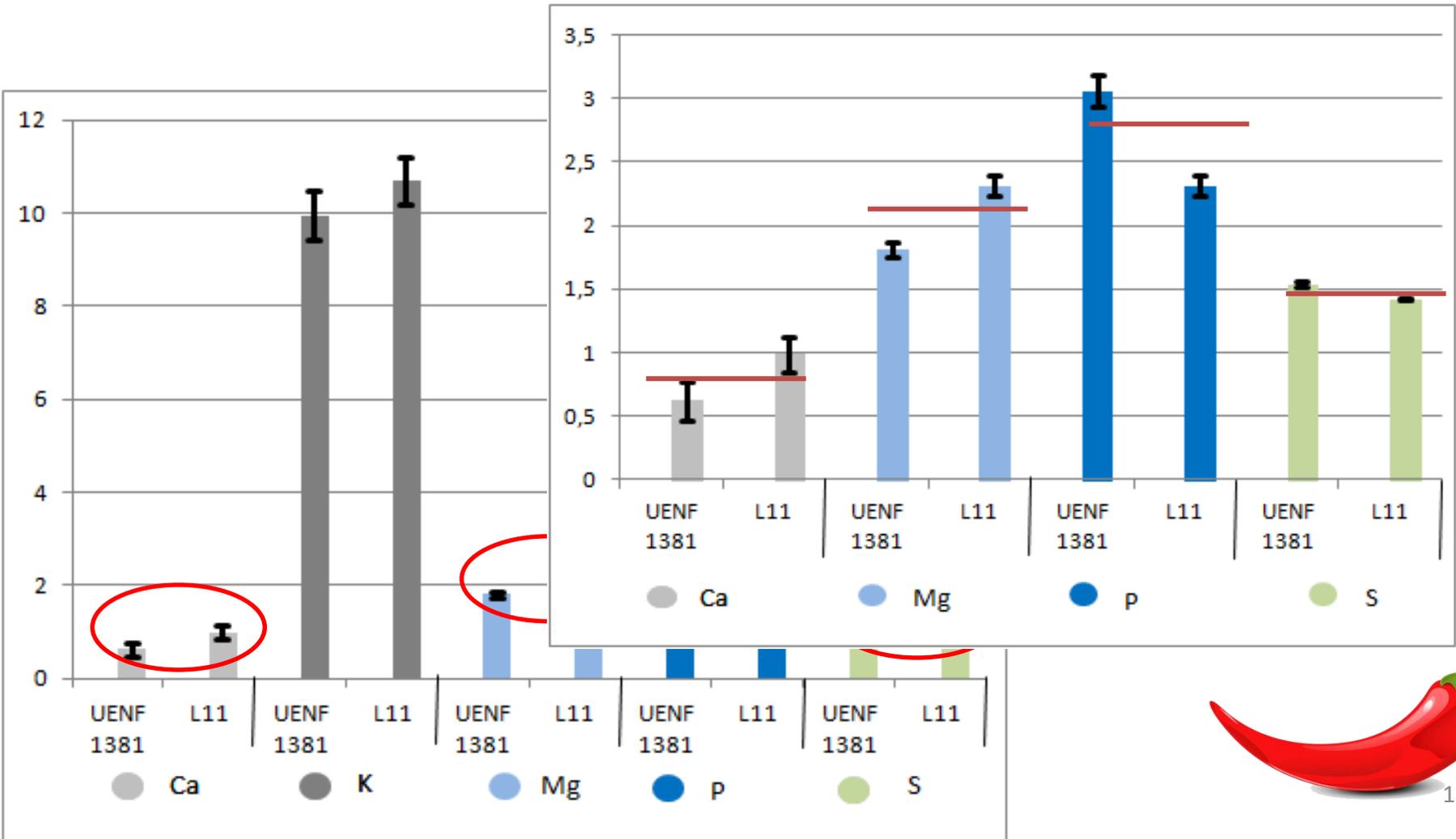
# Results

Pericarp 40 days after the anthesis (DAA)



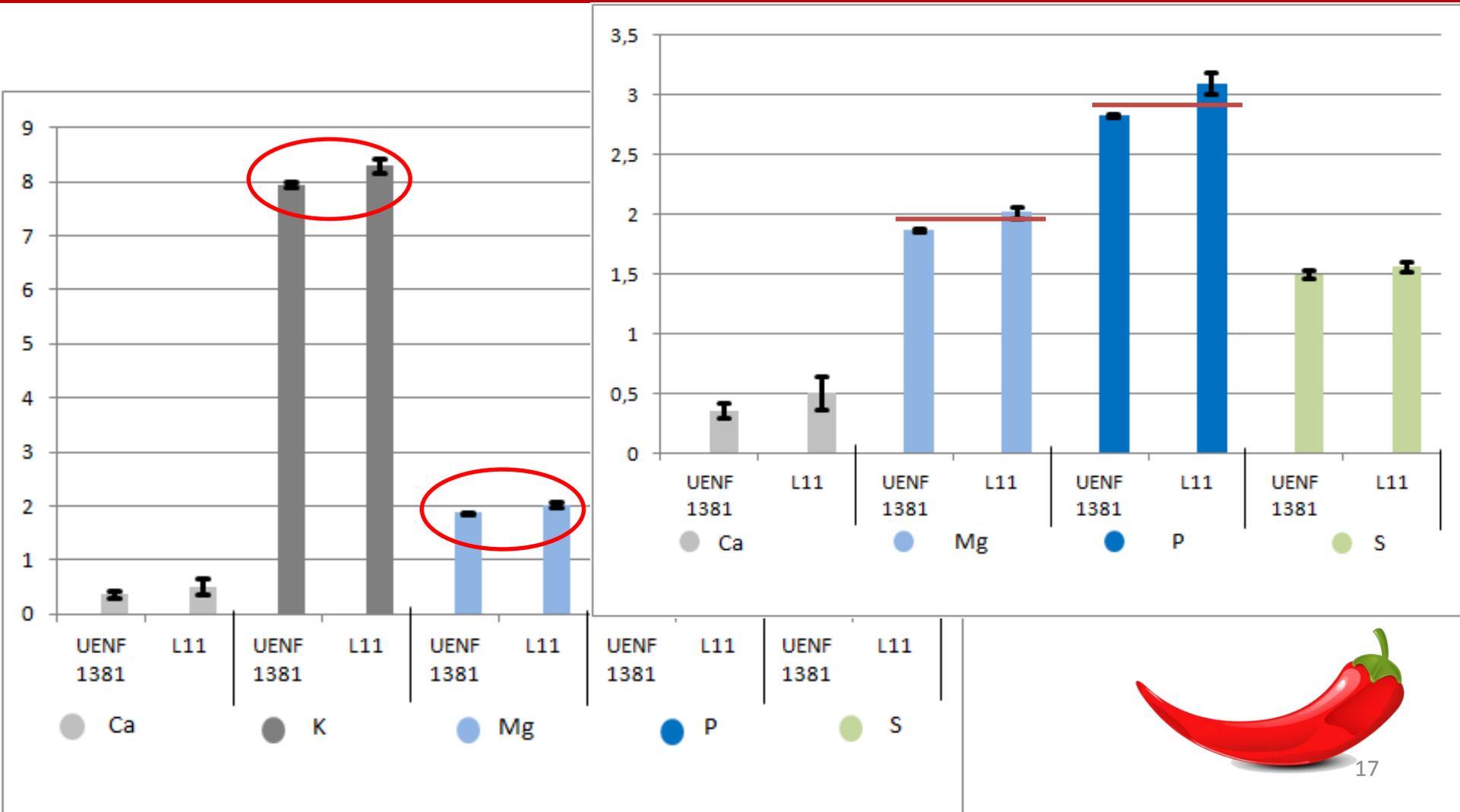
# Results

Seeds with placenta 30 days after the anthesis (DAA)



# Results

Seeds with placenta 40 days after the anthesis (DAA)



# Results

	UENF1381	L11
Pericarp 30 DAA	-	↑ Mg, P
Pericarp 40 DAA	↑ K, Mg, S	↑ Ca
Seeds and placenta 30 DAA	↑ P, S	↑ Ca, Mg
Seeds and placenta 40 DAA	↑ K, Mg, P	-

**UENF1381= Resistant**  
**L11= Susceptible**



# Discussions

## ■ Calcium

- Stimulates microbial activity;
- uptake of other nutrients;
- Can helps with disease resistance for host plants and prevents penetration of pathogens. Ca is a structural component of cell walls and membranes.



# Discussions

## ■ Potassium

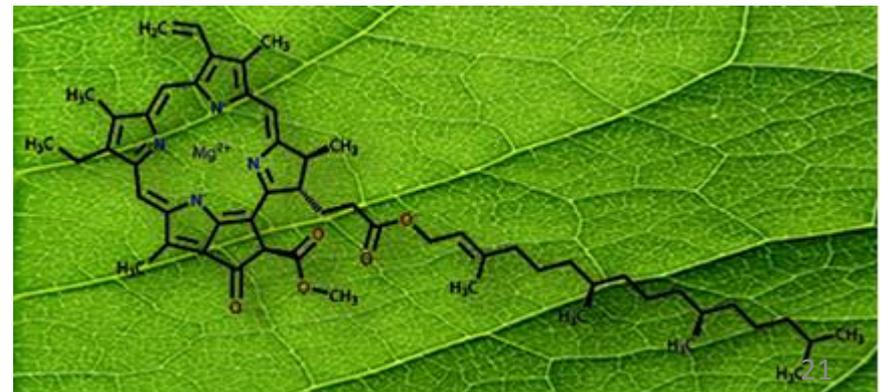
- K is effective in helping control plant diseases and pests.
- As a mobile regulator of enzyme activity
- K is involved in essentially all cellular functions that control disease severity.



# Discussions

- Magnesium

Magnesium may increase some diseases such as bacterial spot of tomato and pepper and reduce other diseases, such as bacterial soft rot of tomato. The rate, source, time of application, nutrient status of the plant, and interactions with other minerals in the plant or pathogen are important considerations in understanding the role of Mg in disease resistance or susceptibility.



# Discussions

- Phosphorus

The significant difference between the concentrations of this element may indicate differences in some metabolic processes, because the phosphorus is involved in these processes, has structural function and also participates in the energy process of the plant.



# Discussions

- Sulfur

- Sulfur is involved in the synthesis of proteins;
- It acts in the protection against abiotic stresses and biotic stresses.



# Conclusion

There are differences between the mineral profiles of the two genotypes, these differences may indicate different biosynthetic routes.

These differences may be associated with specific characteristics of the genotypes and some elements involved in a biosynthetic route related with a defense mechanism of the UENF1381 genotype.



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