



## ANTIFUNGAL PROTECTION BY ENDOPHYTIC BACTERIA IN LEGUMES

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### INTRODUCTION

Peanut and chickpea are two of the major crops cultivated in Argentina. Two different fungal diseases generate substantial yield losses annually. *Ascochyta rabiei*, causal agent of aschochyta blight and *Thecaphora frezii* is the causal agent of peanut smut. Beneficial bacteria have the potential to provide antifungal effects that could be used as bioproducts to control these diseases. Our project aims to identify endophytic bacteria with antifungal effects in vitro and in vivo.

### METHODOLOGY

~100 isolates from chickpea and peanut were screened analyzing inhibition of fungal growth and germination. 6 isolates were selected and tested in vivo. For chickpea, leaflets or whole plants were infected with *A. rabiei* conidia. The bacteria isolated were inoculated 15 min ( $1 \times 10^8$ ) or two days ( $1 \times 10^5$ ) prior the infection, respectively. For peanut, the soil was inoculated with *T. frezii* spores ( $1 \times 10^5/g$ ) and the bacteria were inoculated at sown, flowering, and pegging times ( $1 \times 10^5$ ). Incidence of both diseases was quantified at the end of each assay (30 days for chickpea, 155 days for peanut).

### RESULTS: CHICKPEA

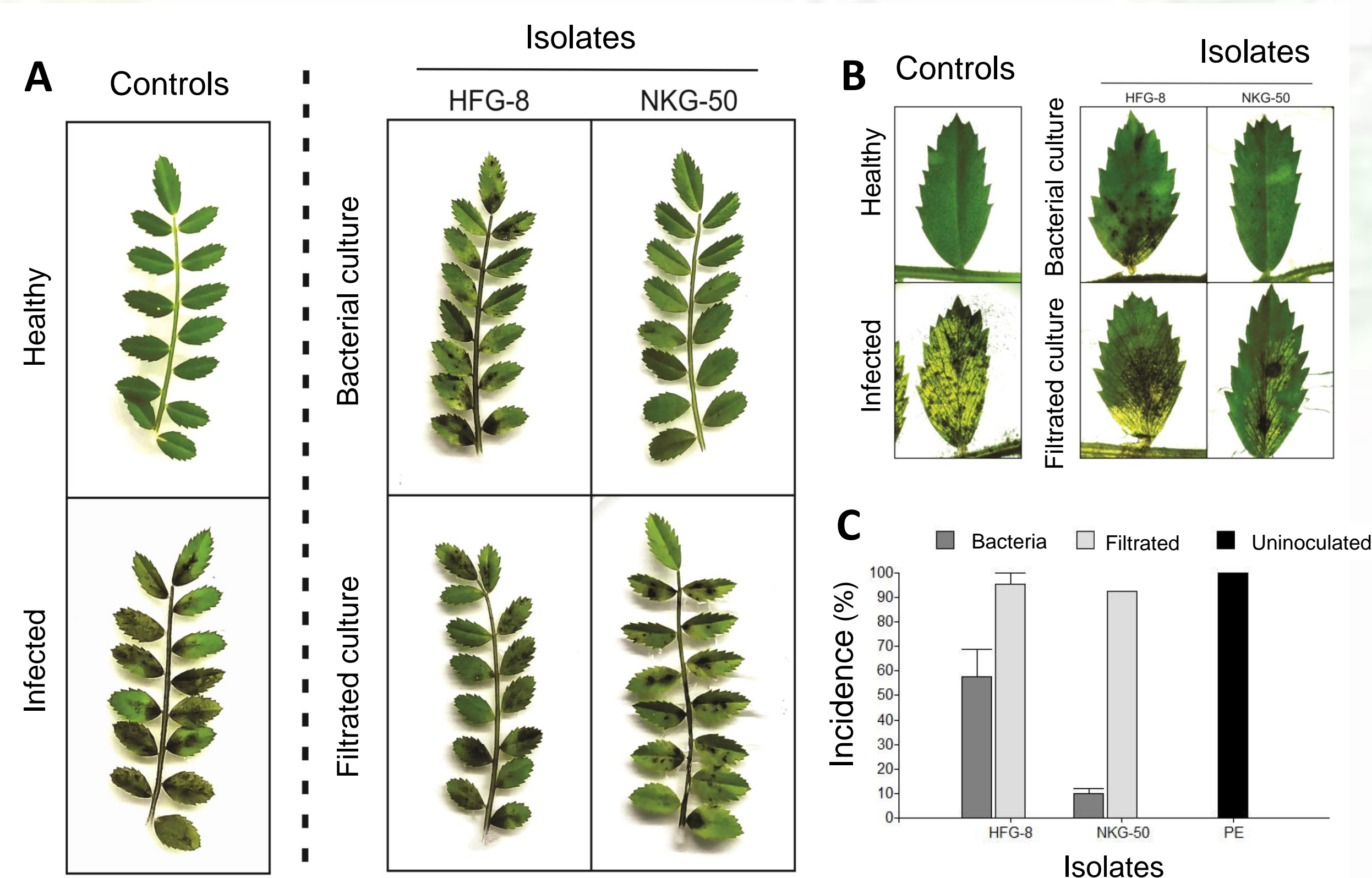


Figure 1. Chickpea leaves (A) and leaflets (B) infected with *A. rabiei* and inoculated with bacterial isolates HFG-8 and NKG-50, previously tested in vitro. (C) Ascochyta blight incidence quantification for both isolates applied as the whole culture or filtrated (without cells) (n=10).

### RESULTS: PEANUT

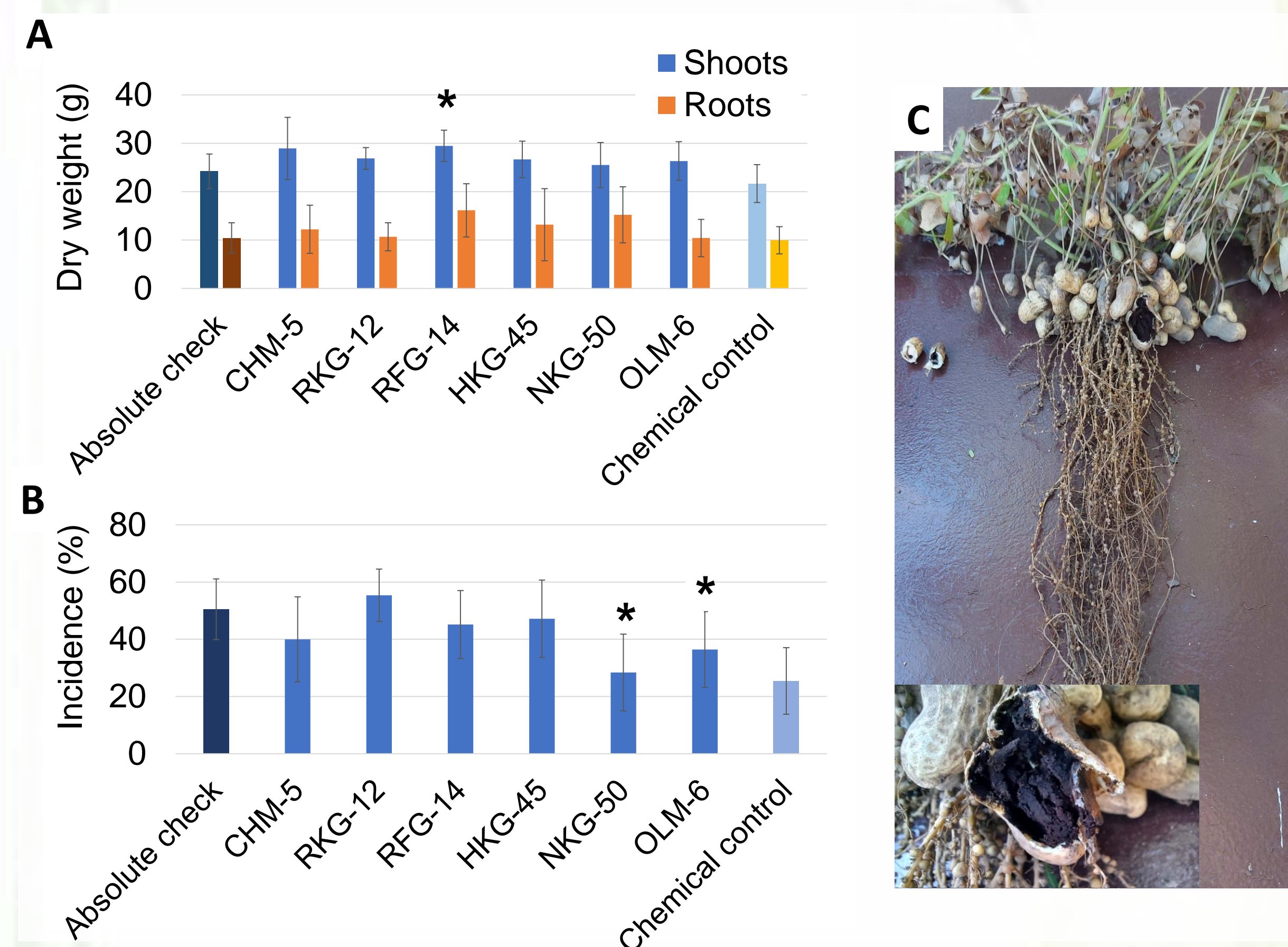


Figure 2. Dry shoot and root biomass (A) and *T. frezii* incidence (B) in peanut plants grown during the whole growth season in pots with soil infected with *T. frezii* and soil and leaves inoculated with each isolate at sown, flowering, and pegging times. n=10. \*=(Ttest, p<0.05) (C) Peanut plant and smut symptom in the pods.

### CONCLUSIONS

NKG50 shown a broad-spectrum antifungal activity against both pathogens, it's the strongest candidate to develop a novel bioinput. RFG-14 showed PGRP effect in peanut shoots.

Subjacent mechanisms will be further analyzed

### ACKNOWLEDGMENT