IDENTIFICATION, CHARACTERIZATION AND ANTAGONISTIC ACTIVITY OF BACTERIA ISOLATED FROM A PSA-FREE KIWIFRUIT ORCHARD

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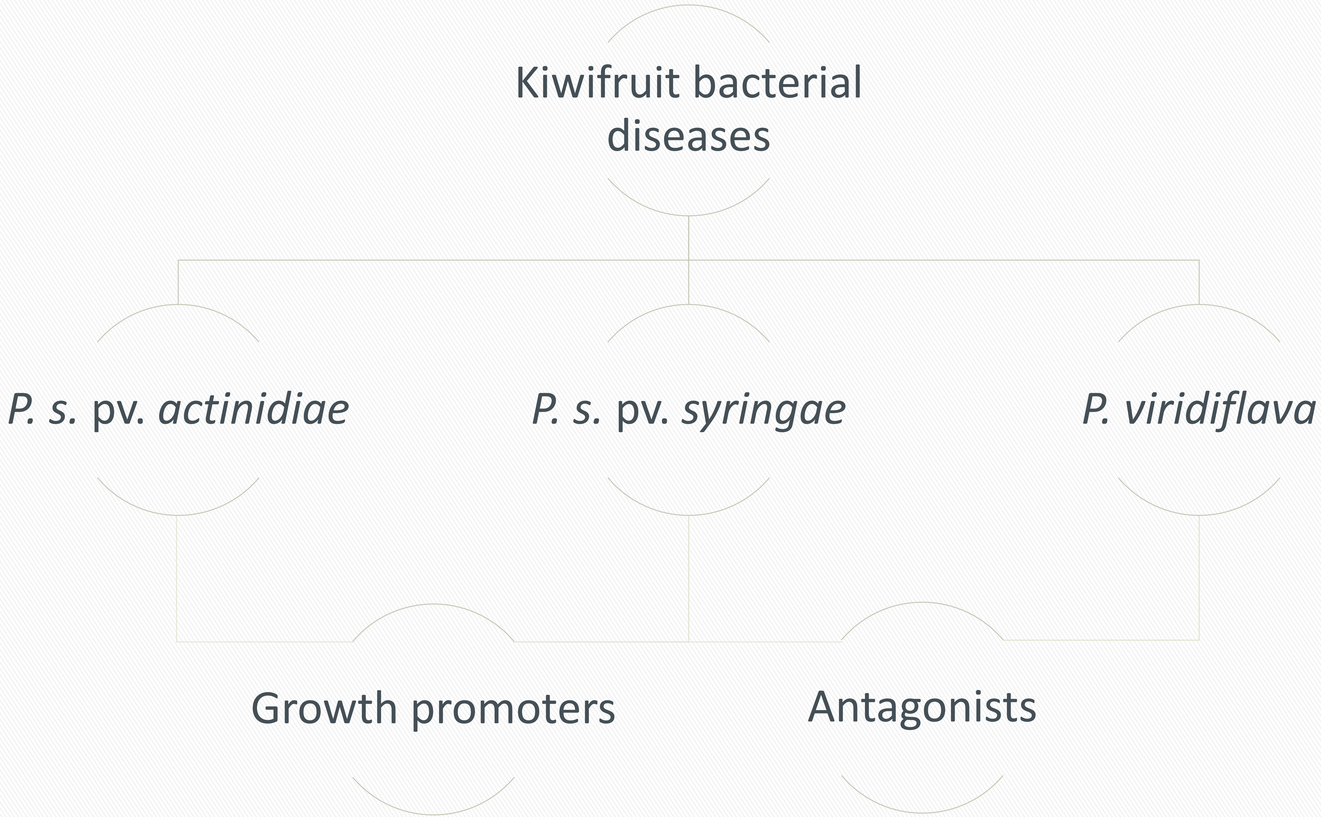
PROBLEM AND INTRODUCTION

Pseudomonas syringae pv. *actinidiae* (Psa) was detected in Portugal for the first time in 2010 and has spreaded to all kiwifruit production regions.

The losses in production caused by this bacteria are unavoidable since there are no curative treatments.

Beyond this pathogen, *Pseudomonas syringae* pv. *syringae* (Pss) and *Pseudomonas viridiflava* (Pv) may also endorse production losses and plant weakening.

The aim of this study was to isolate *Pseudomonas* sp. from a Portuguese kiwifruit orchard, free of Psa but with Pss and Pv present, in an attempt to detect possible plant growth-promoting bacteria (PGPB) and antagonists able to control Psa, Pss and Pv.



METHODS

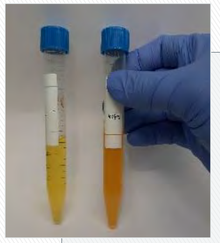
- The isolates were collected from a Portuguese kiwifruit orchard free of Psa.
- Both epiphytic and endophytic bacteria were isolated from *Actinidia chinensis* var. *deliciosa* using modified King's medium B and identified by molecular tests.
- A total of 362 strains were typed with RAPD-PCR fingerprinting, forming 240 clusters that were identified by *16S rRNA*, *gapA* and *rpoD* genes sequencing and Real-time PCR.
- A total of 8 genera were identified. *Pseudomonas* was the predominant, followed by *Rosenbergiella*.
- Possible antagonistic and PGPB activity was assessed *in vitro* for 230 isolates.

Genera	Nº Isolates
Pseudomonas	193
Rosenbergiella	27
Listeria	1
Neobacillus	1
Paenibacillus	1
Sphingomonas	6
Staphylococcus	1

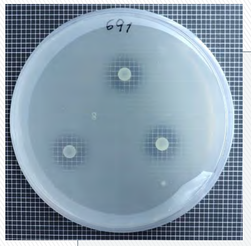
RESULTS

Number of isolates positive for:

Siderophore production → 54



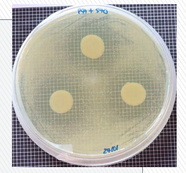
Ammonia production → 39



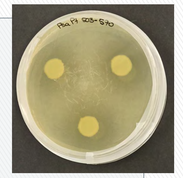
Phosphate solubilization → 28

Number of isolates with antagonist effect against:

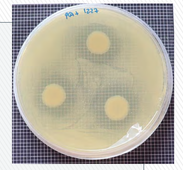
22 ← Psa Italian strain



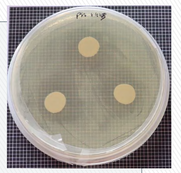
17 ← Psa Portuguese strain



3 ← Pss



5 ← Pv



DISCUSSION AND CONCLUSION

- This work reveals that there are naturally occurring strains in kiwifruit orchards with potential antagonist effect against Psa, Pv and Pss, as well as with PGPB traits.
- Among all tested strains, 15 were positive for phosphate solubilization, ammonia and siderophore production.
- The most promising one presented antagonist effect against all pathogens and was positive for all PGPB characteristics, except for phosphate solubilization.
- Future studies *in vivo* will be performed to assess their potential use in diseases control.