

Populations of the *Pseudomonas syringae* complex were found in the alluvial aquifer of Avignon

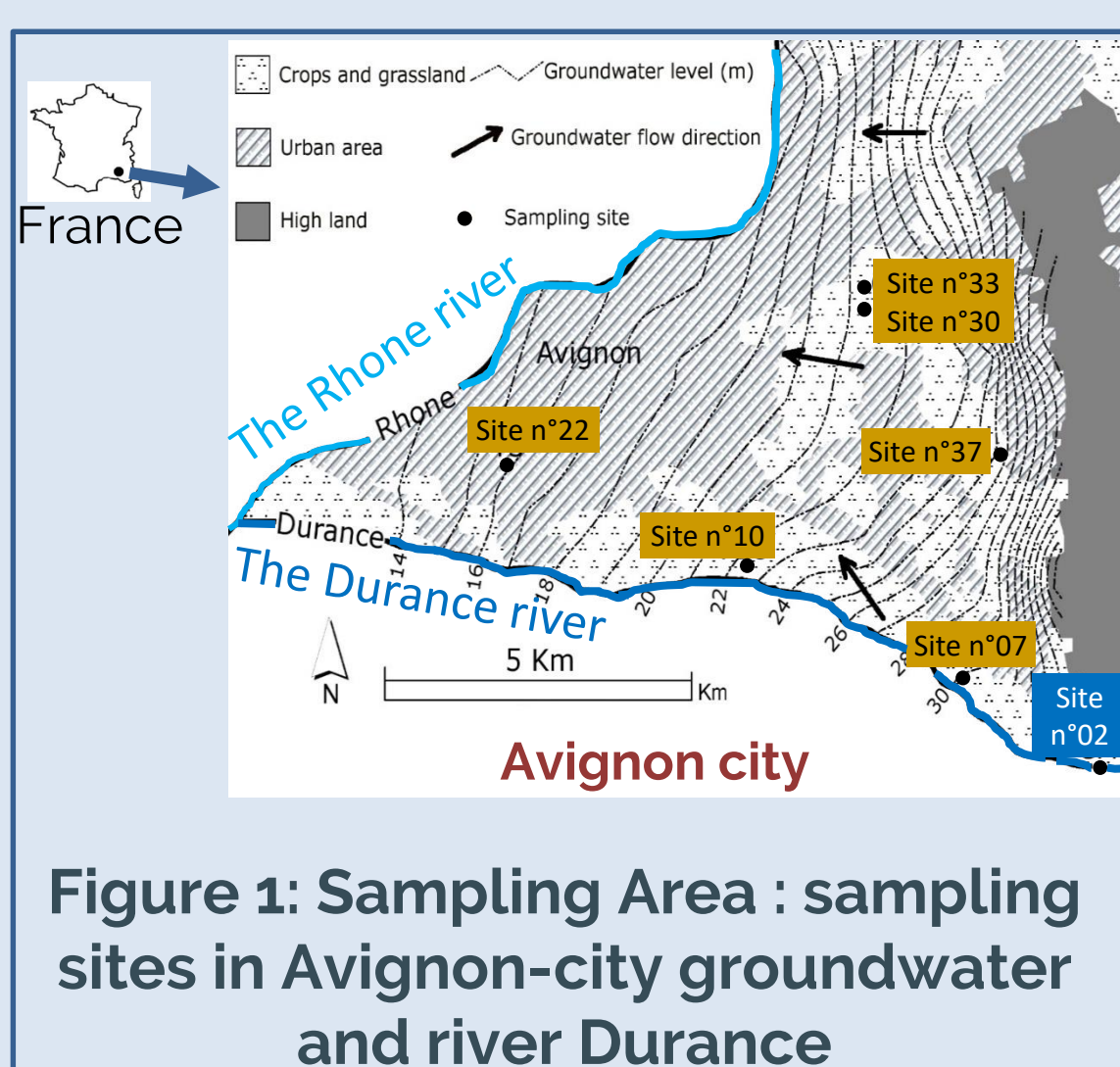
Introduction

1. Groundwater is the main source of freshwater on Earth (98% excluding glaciers).
2. It is increasingly used for crop irrigation and considered to be mostly free of plant pathogens [1].
3. However, *P. syringae* including phytopathogenic bacteria, follows the water cycle and lives in rivers.

➤ The aim of the study was to investigate the presence of *P. syringae* in groundwater and evaluate the risk to irrigated crops.

Materials & methods

1. Groundwater and Durance river water was sampled at 5 dates during one year (Fig. 1) and physicochemically characterized.
2. Water was concentrated by filtration. *P. syringae* strains were isolated using KBC medium [2].
3. Culturable bacterial numbers were estimated on TSA 10% medium [2].
4. *P. syringae* strains were classified through the phylogenetic analysis of partial sequence of the citrate synthase gene (*cts*) [3].
5. Pathogenic potential of strains was assessed via induction of hypersensitivity on tobacco [2].



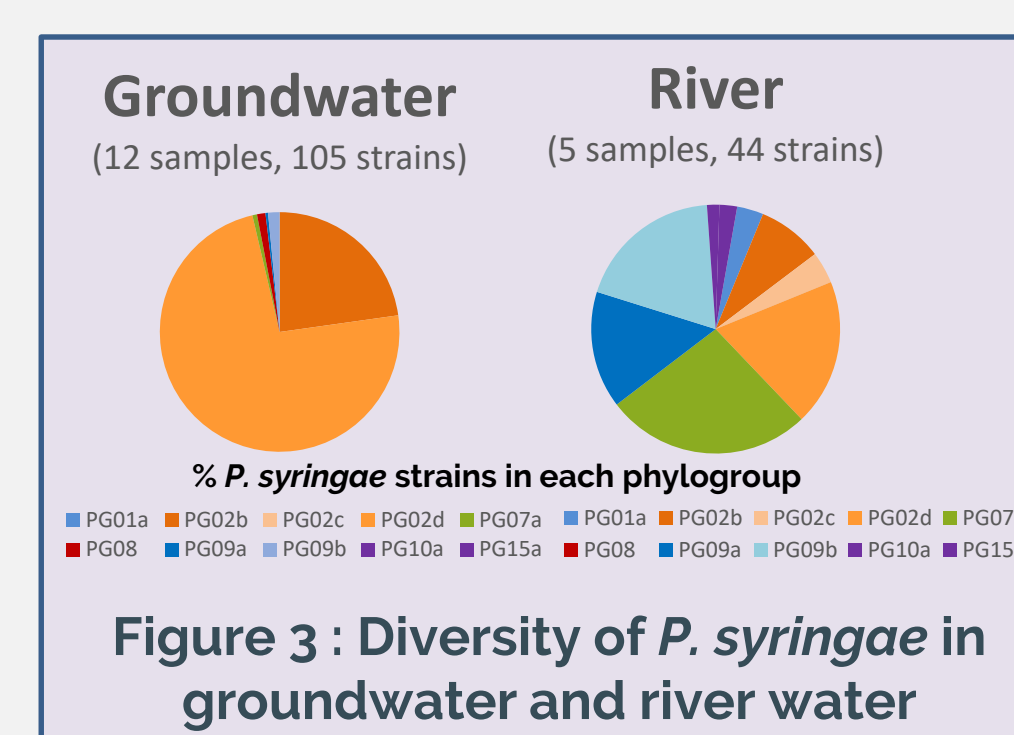
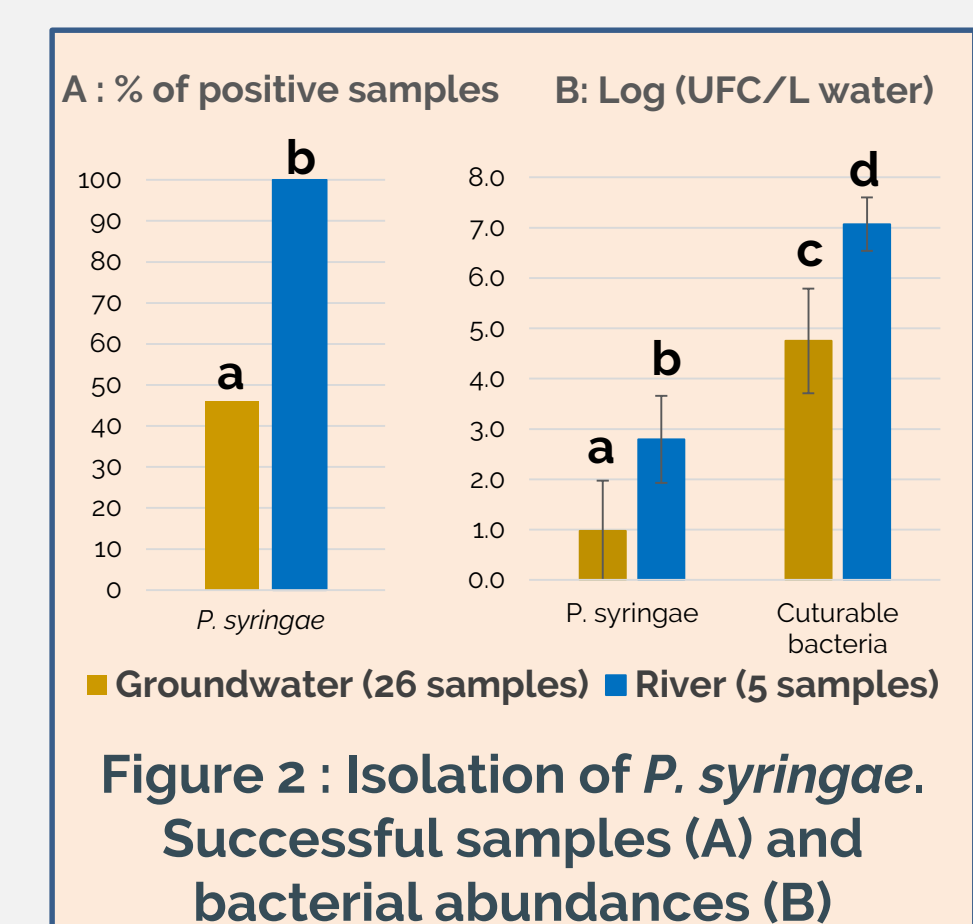
Conclusion

Groundwater used for irrigation can carry plant pathogens. It is a risk for crops which must be anticipated by:

- Improving knowledge on groundwaters and what determines the presence of pathogens
- Consider groundwater in monitoring models used to prevent plant diseases,

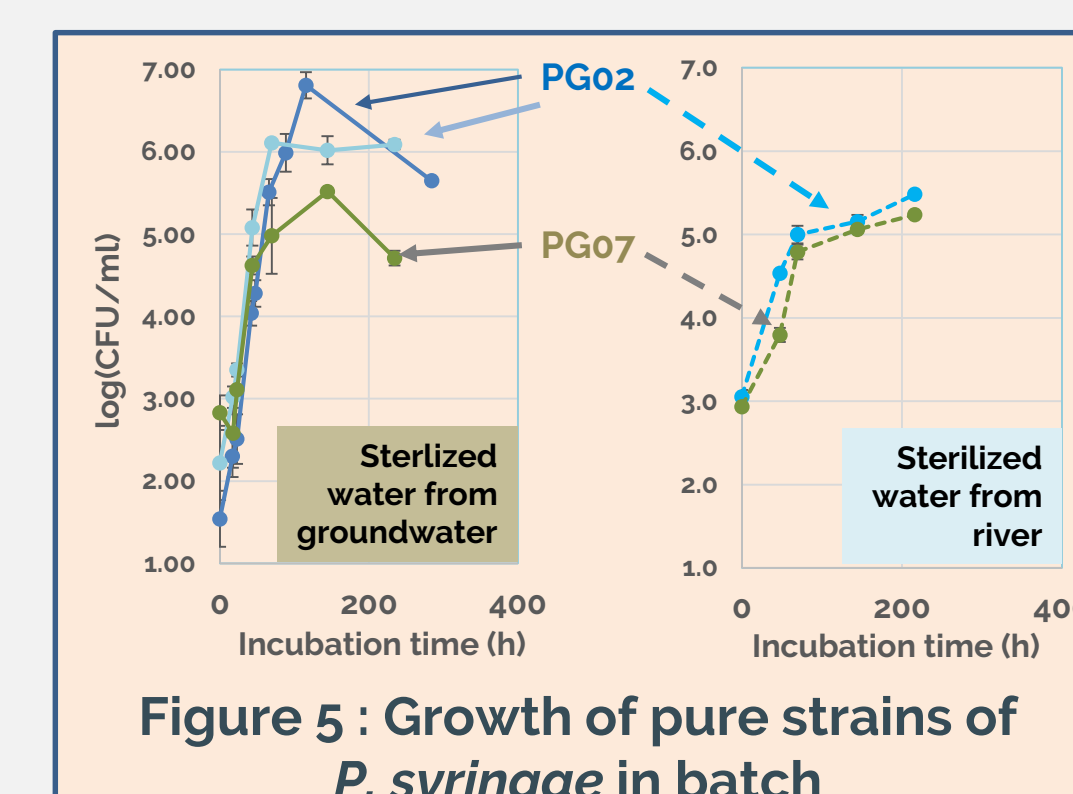
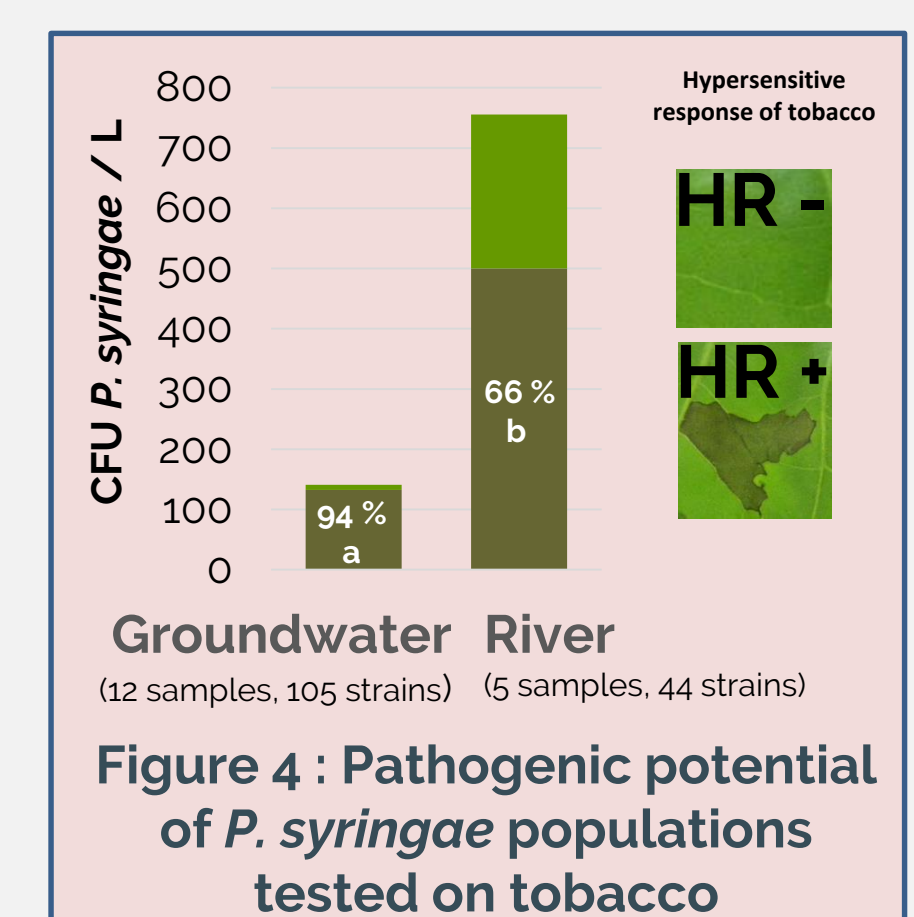
Results

1. *P. syringae* was detected in 46 % of groundwater samples (Fig. 2A) and was less abundant than in the Durance river (Fig. 2B). Water conductivity partly explains abundances of *P. syringae* (data not shown).



2. *P. syringae* was less diverse in groundwater (Fig. 3) and was dominated by the phylogroup 02 known to include many epidemic strains.

3. Potentially phytopathogenic strains dominated in groundwater (Fig. 4). This is consistent with the dominance of phylogroup 02. However, in the best case in one liter, groundwater contains about 4 times fewer HR+ *P. syringae* than in Durance water (Fig. 4).



4. Strains of phylogroup 02 had a better fitness than phylogroup 07, only in water from groundwater (Fig. 5).

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➤ References

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