

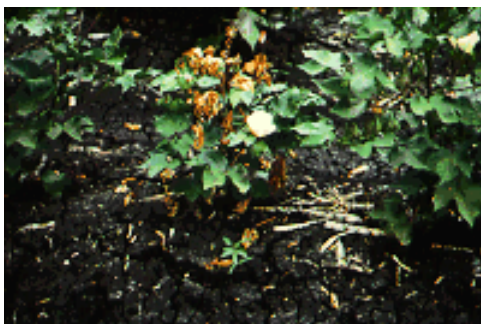
**Constitutive secretion of pisatin
in root exudates participates
in pea defence against
Fusarium oxysporum f. sp. *pisi***

Nicolas Rispaïl, Mustapha Bani, Alessio Cimmino, Antonio
Evidente and Diego Rubiales

Fusarium oxysporum causal agent of vascular wilt



f.sp. ciceri



f.sp. vasinfectum



f.sp. cubense



f.sp. pisi



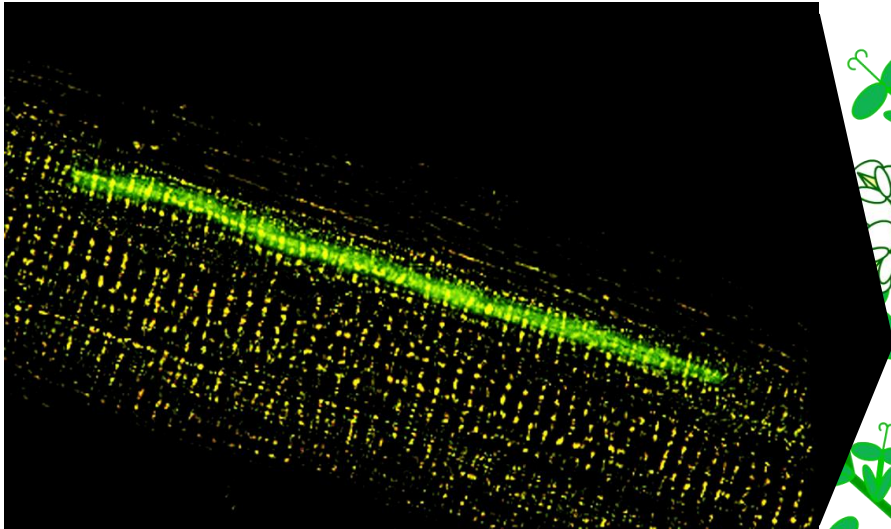
f.sp. melonis



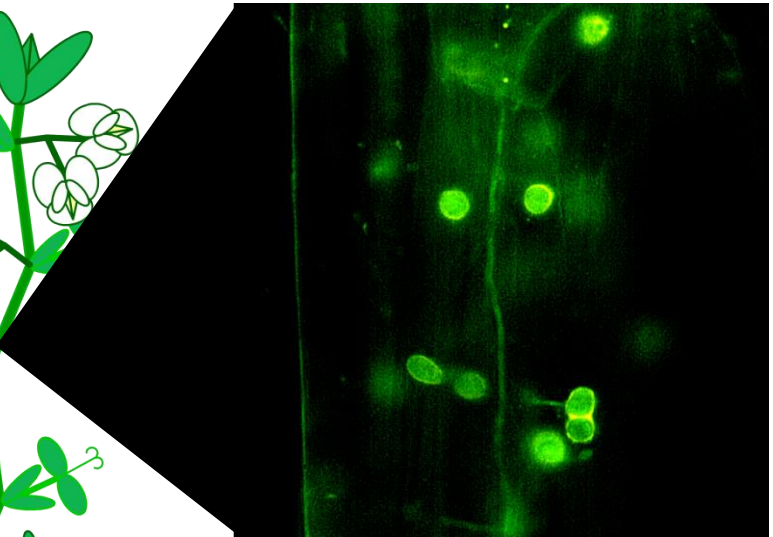
f.sp. lycopersici

Fusarium oxysporum infection cycle

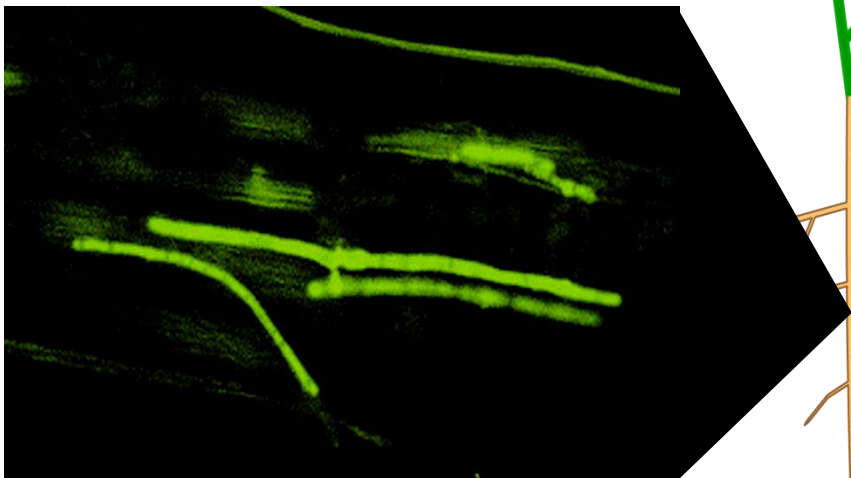
Xylem vessel colonization



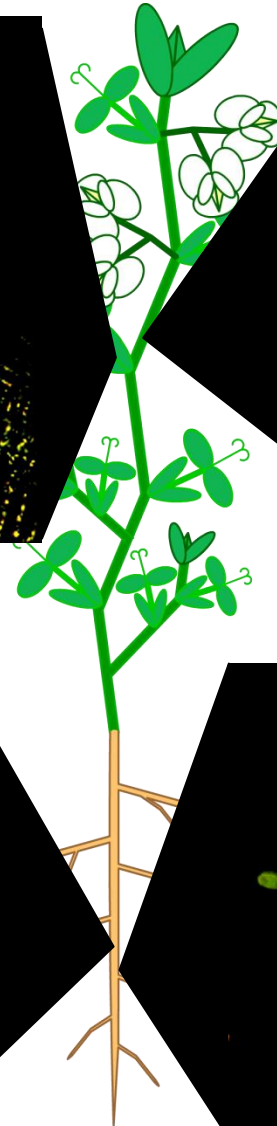
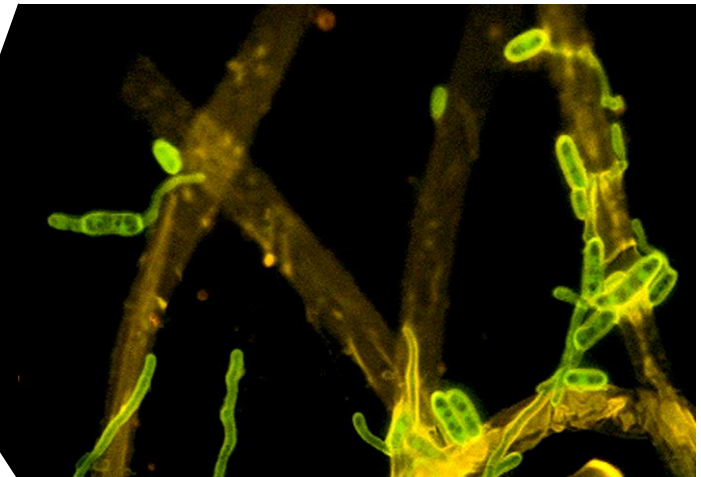
Chlamidospore formation



Cortex invasion



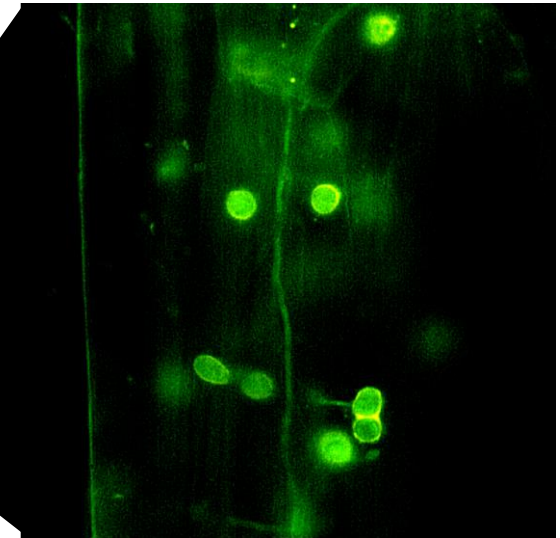
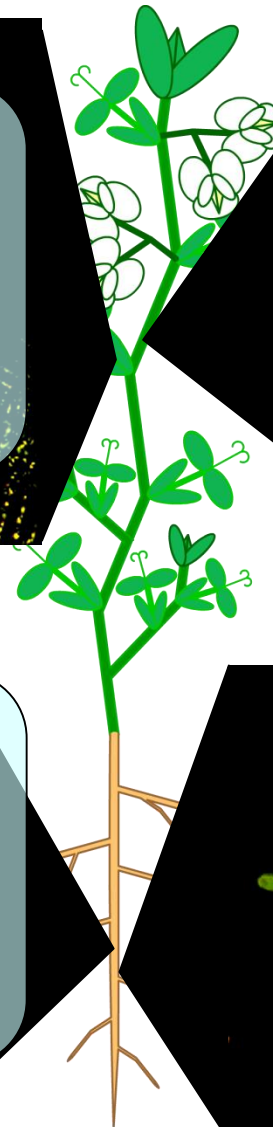
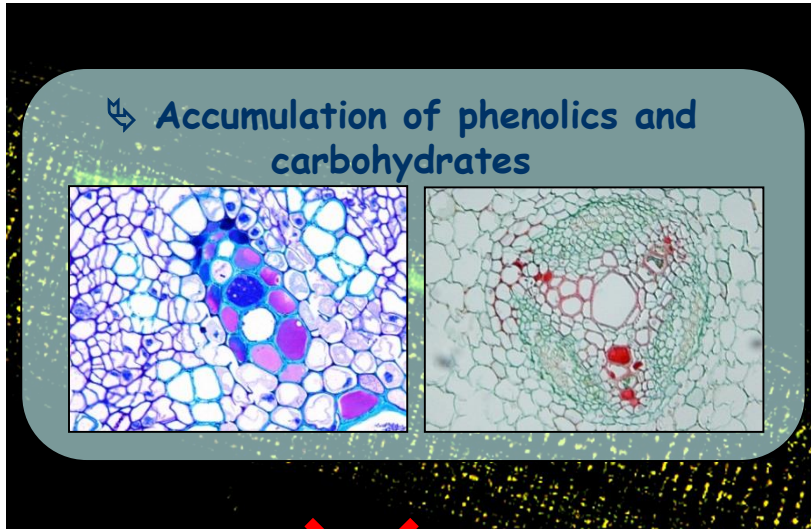
Root adhesion and entry



Fusarium oxysporum infection cycle

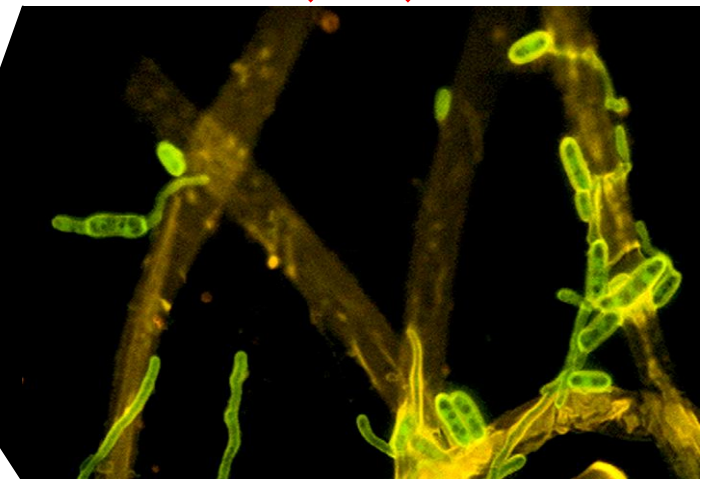
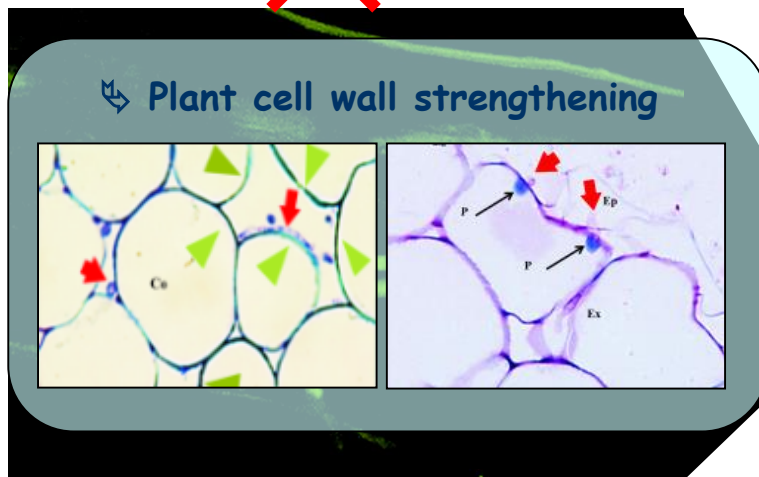
~~Xylem vessel colonization~~

Chlamidospore formation



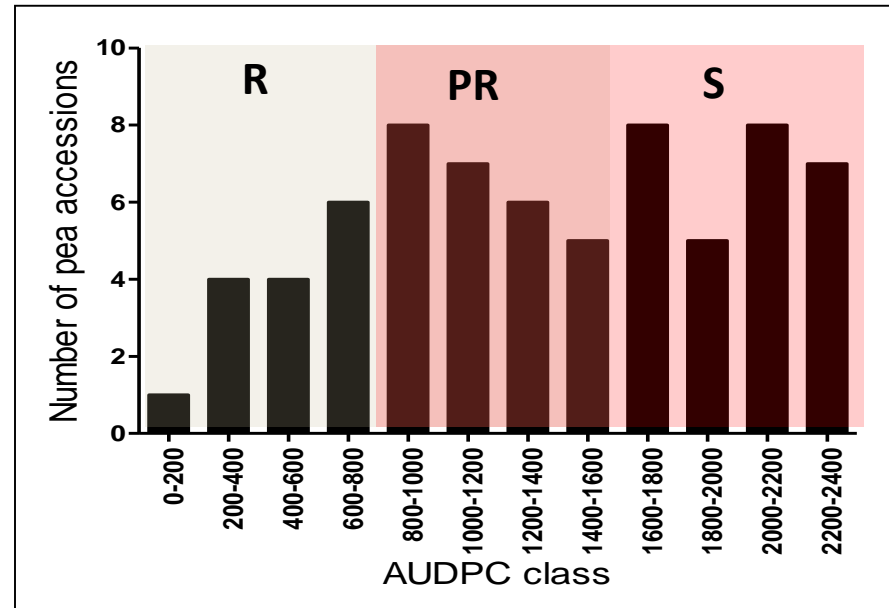
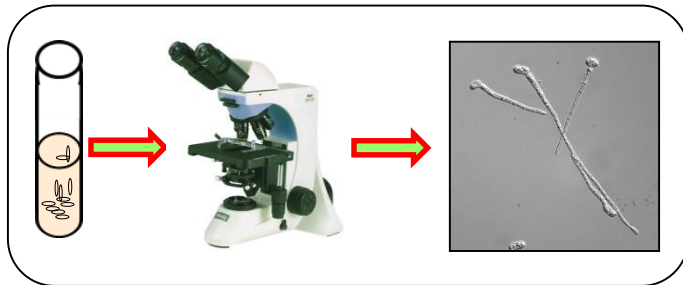
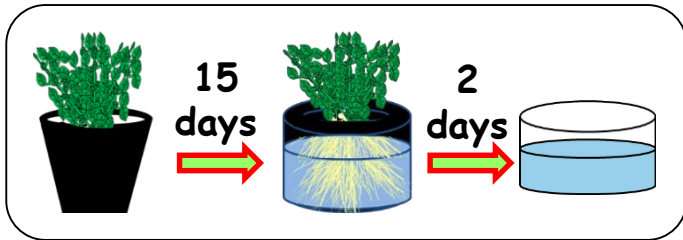
~~Cortex invasion~~

~~Root adhesion and entry~~



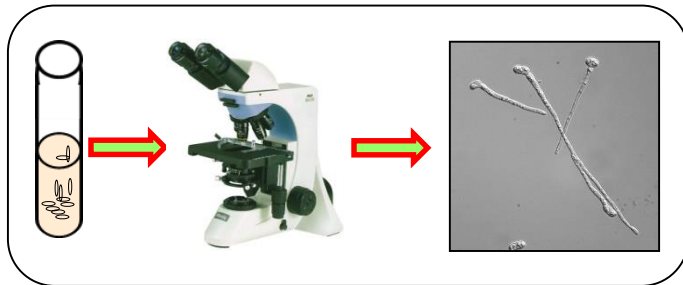
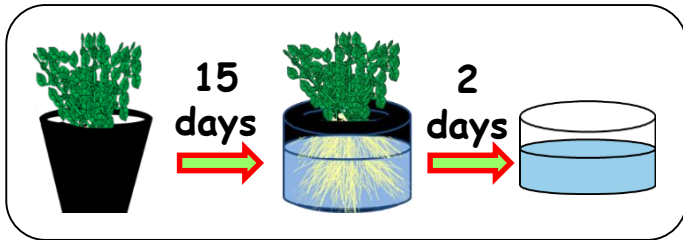
Pea resistance to *Fusarium oxysporum* f. sp. *pisi*

Pre-penetration resistance: Effect of pea root exudates

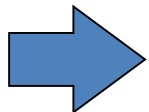
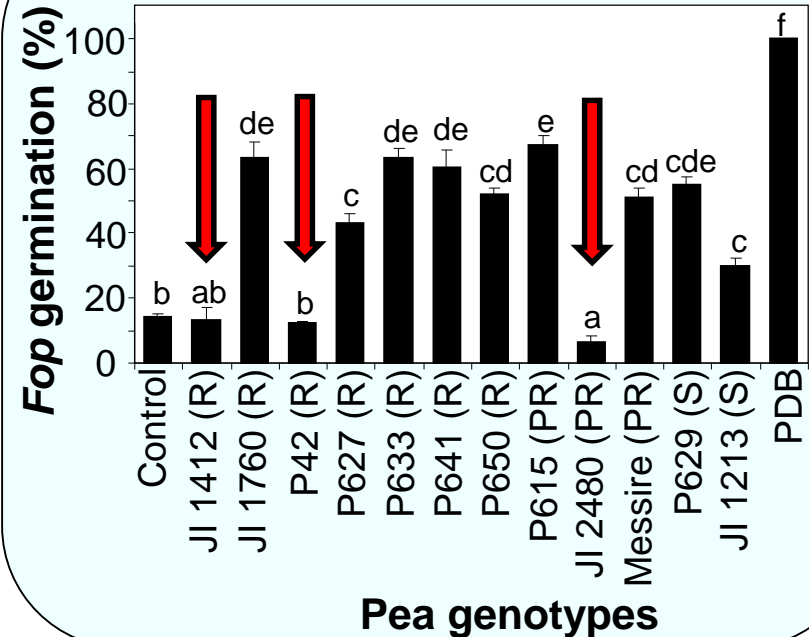


Pea resistance to *Fusarium oxysporum* f. sp. *pisii*

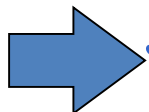
Pre-penetration resistance: Effect of pea root exudates



Effect of pea root exudate on *Fop*



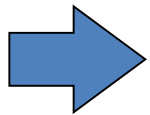
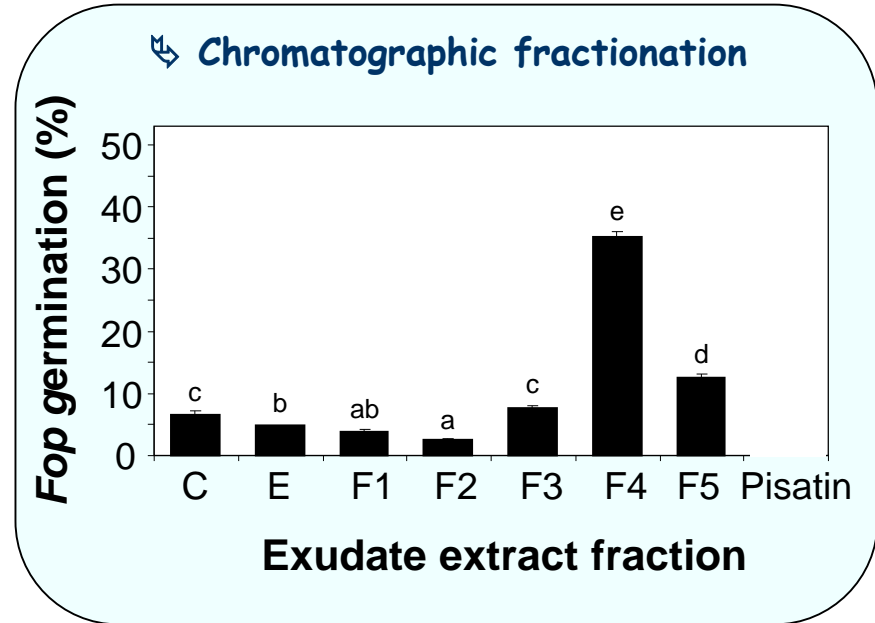
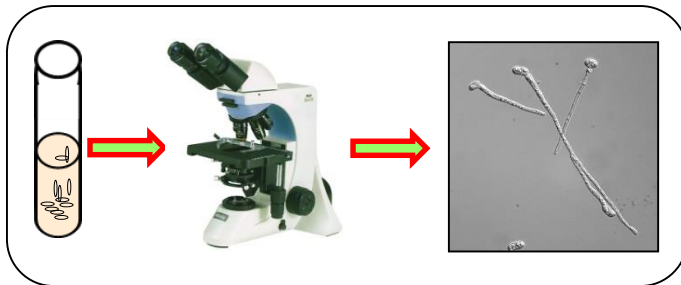
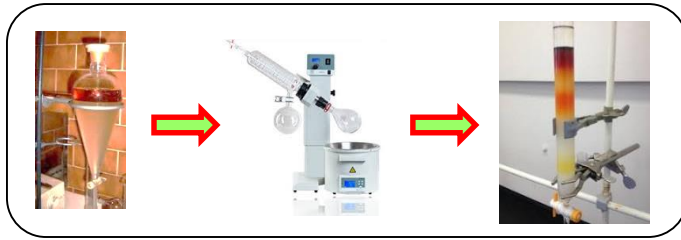
Some root exudate inhibited *Fop* germination



Some pea accession express a pre-penetration mechanism of defense

Pea resistance to *Fusarium oxysporum* f. sp. *pisii*

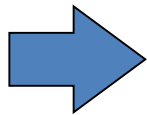
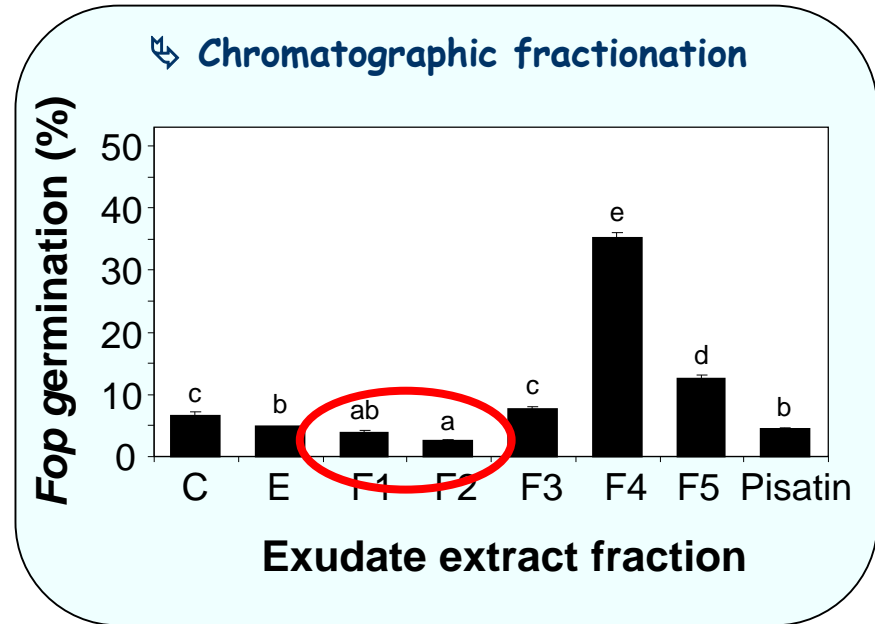
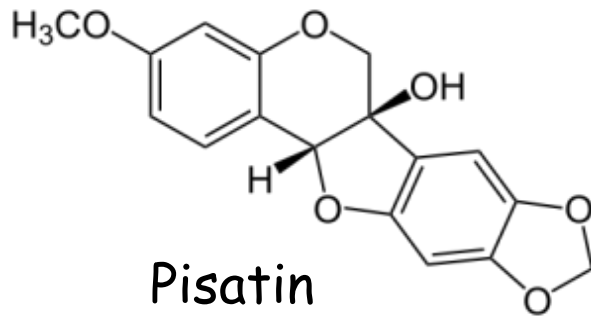
↪ Extraction and Fractionation of Root Exudates



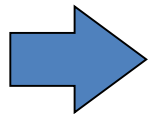
Plant secrete both stimulants and inhibitors

Pea resistance to *Fusarium oxysporum* f. sp. *pisi*

↪ Extraction and Fractionation of Root Exudates



Plant secrete both stimulants and inhibitors

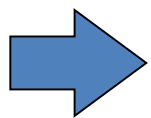
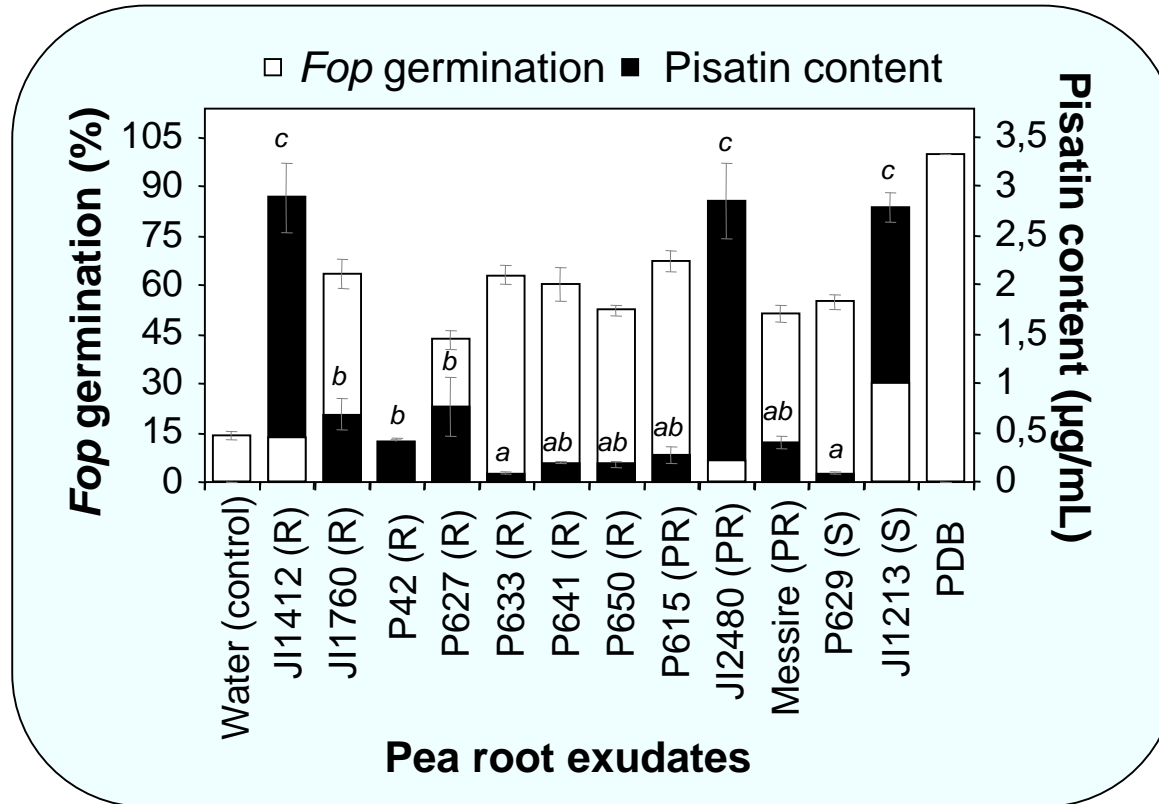


Pisatin inhibit *Fop* germination

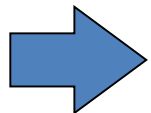
Pea resistance to *Fusarium oxysporum* f. sp. pisi



↪ Pisatin content of pea root exudates



Correlation between secreted pisatin and inhibition of *Fop* germination



Other inhibitors

Pea resistance to *Fusarium oxysporum* f. sp. *pisi*



↪ Pisatin content in pea roots

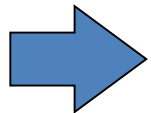
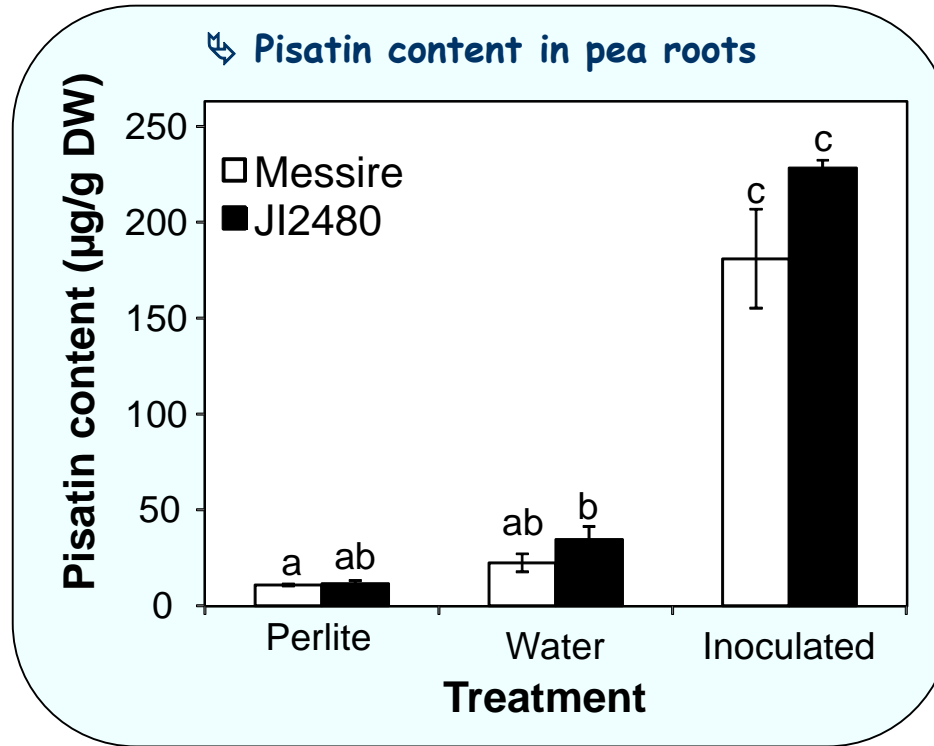
➔ Pisatin is responsible of inhibition of Fop germination

➔ Pisatin acumulation in root exudate constitutive or induced?

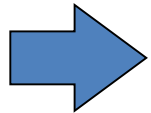
Pea resistance to *Fusarium oxysporum* f. sp. *pisi*



↪ Pisatin content in pea roots



No induction of pisatin biosynthesis by experimental handling



Inhibiting pisatin is constitutively secreted

↪ Concluding remarks

- ✧ Some pea accessions express a defense mechanism acting before root penetration
- ✧ Secreted pisatin is the major component of this constitutive defense mechanism
- ✧ Other metabolites can be involved

↪ Future prospect

- ✧ Identification of additional inhibitors and stimulants of *Fop* germination
- ✧ Characterization of their effect on *Fop*



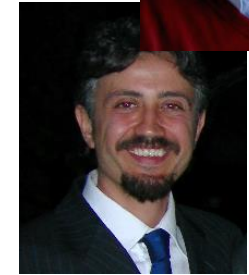
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Mustapha Bani



Antonio Evidente



Alessio Cimmino

Fundings:

Grant AGL2014-52871-R
funded by:



UNIÓN EUROPEA



European KBBE Project LEGATO
(FP7-KBBE2013.1.2-02-613551)

