Stemphylium lycopersici isolates virulence depends on the synthesis of phytotoxic metabolites, which is modified by the environment

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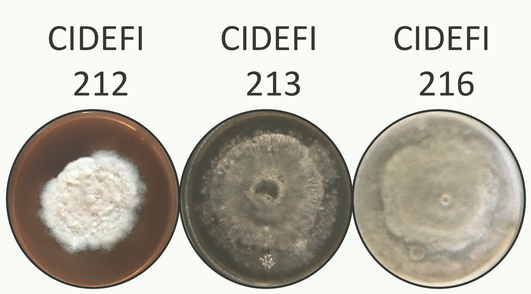
INTRODUCTION

Stemphylium lycopersici (Pleosporales) is one of the causal agents of gray leaf spot in tomato, a disease that provokes severe yield reductions and economic losses in Argentina and worldwide [1]. Low molecular weight secondary metabolites (SMs) secretion could contribute to virulence or pathogenicity of the fungus [2]. Based on its draft genome sequence [3] several SMs gene clusters were predicted within the genome of CIDEFI 216, a *S. lycoperisici* isolate [4]. The aim of this work was to study the SMs array in isolates of *S. lycopersici* that differ in their virulence and ability to sporulate.

MATERIALS AND METHODS



Growth on PDA medium (and on V8 one)

Lyophilization.

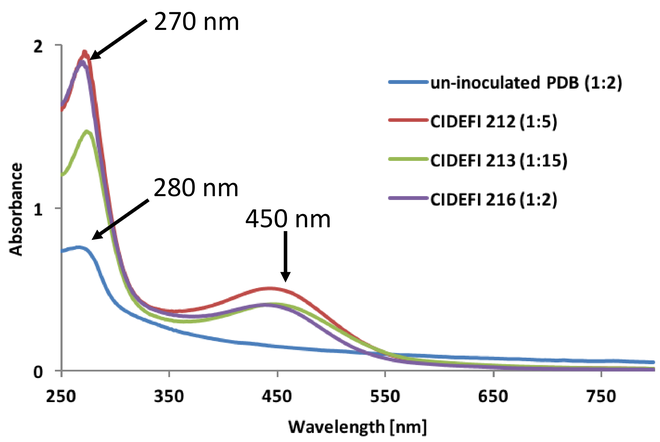
300 mg of lyophilized
+
15 ml of sterile water

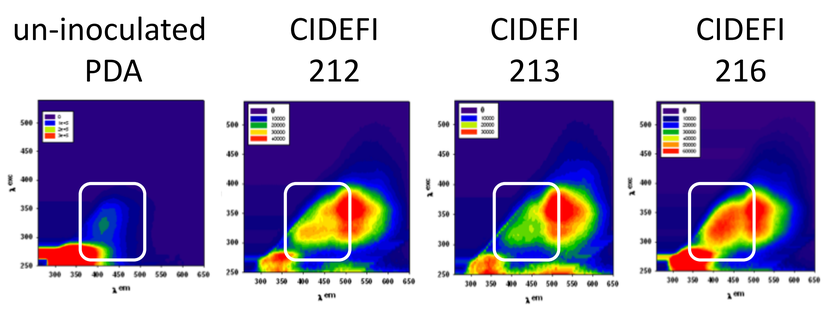
SMs Extraction [5]
3 hours by sonication (1000W, 40 kHz).
+
Filtration through membranes (0.45 µm).

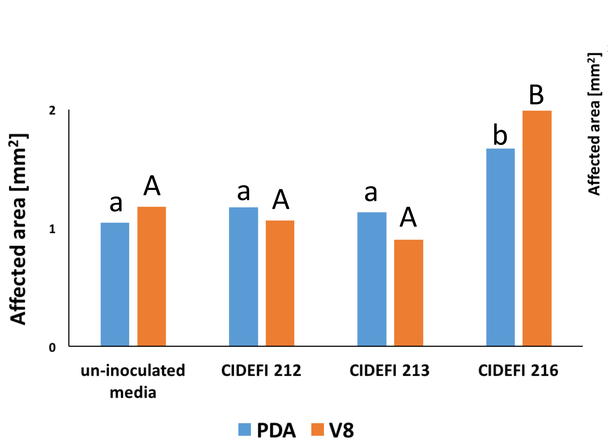
Phytotoxicity:
Detached leaf assay [1, 6].
Analysis of variance (ANOVA) after Fisher test, $p<0.05$.

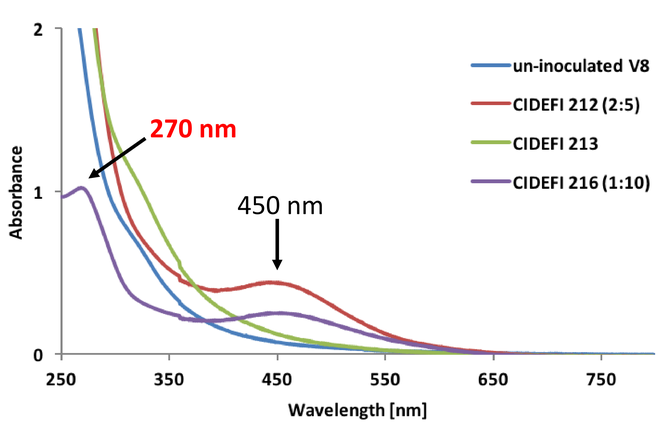
Photochemical analysis [7]:
UV–Vis absorption spectra.
Fluorescence–excitation-emission matrices (FEEM).

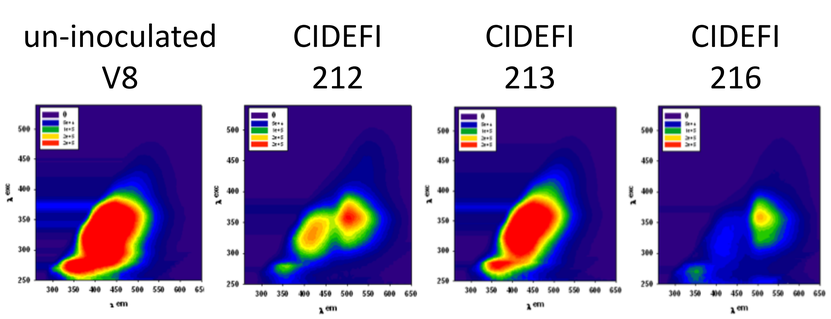
RESULTS











CONCLUSIONS

- **CIDEFI 216 when grown on V8 medium presented a distinctive absorption spectra.**
- **Fluorescence emission was a function of the fungal isolate and the culture medium.**
- **Extracts from CIDEFI 216 grown on PDA presented the highest fluorescence emission spectra (400-450 em / 300-360 exc).**
- **Extracts from CIDEFI 216 provoked lesions on tomato leaflets, and this effect depends on media where the fungus was grown.**

Bibliography. [1]. Franco *et al.* (2017). "A survey on tomato leaf grey spot in the two main production areas of Argentina led to the isolation of *Stemphylium lycopersici* representatives which were genetically diverse and differed in their virulence." *Eur J Plant Pathol*., **doi:10.1007/s10658-017-1248-z**. **[2].** Pusztahelyi *et al.* (2015). "Secondary metabolites in fungus-plant interactions." *Front. Plant Sci*., **doi: 10.3389/fpls.2015.00573. [3].** Franco *et al.* (2015). "Draft Genome Sequence and Gene Annotation of *Stemphylium lycopersici* Strain CIDEFI-216." *Genome Announc.*, **doi:10.1128/genomeA.01069-15. [4].** Franco *et al.* (2016). "In silico screening of genes coding for secondary metabolites in the phytopathogenic fungus *Stemphylium lycopersici*." In *American Phytopathological Society annual meeting*. **[5].** Li *et al.* (2017). "GC – MS, FTIR and Raman Analysis of Antioxidant Components of Red Pigments from *Stemphylium lycopersici*." *Curr. Microbiol.*, **doi:10.1007/s00284-017-1220-3**. **[6].** Esmailzadeh *et al*. (2008). "Exogenous Applications of Salicylic Acid for Inducing Systematic Acquired Resistance Against Tomato Stem Canker disease." *Journal of Biological Science*., **doi:10.3923/jbs.2008.1039.1044. [7].** Medina *et al.* (2018). "Remediation of a soil chronically contaminated with hydrocarbons through persulfate oxidation and bioremediation" *Sci. Total Environ.,* **https://doi.org/10.1016/j.scitotenv.2017.10.326.**