

Photoinactivation of *Colletotrichum truncatum*, *Corynespora cassiicola*, *Sclerotinia sclerotiorum* and *Rhizoctonia solani* in soybean seeds by cationic porphyrins

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Introduction

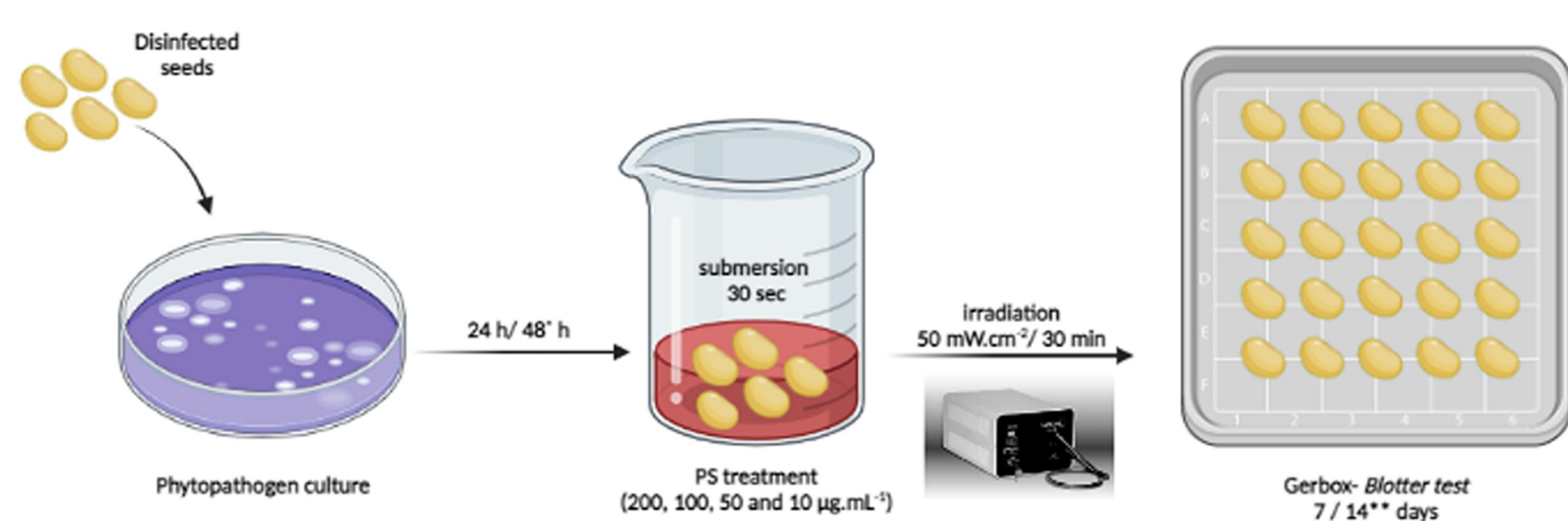
Soybean is one of the most produced and consumed grains worldwide. Brazil, the world's largest producer of the grain, represents around 50% of the national grain production (Conab, 2021). Among the main causes of crop losses are diseases caused by pathogens that infect seeds, such as *Colletotrichum truncatum*, *Corynespora cassiicola*, *Sclerotinia sclerotiorum* and *Rhizoctonia solani*.

The fungicides used are not totally effective in controlling these diseases, requiring new options with less impact on the environment. **Photodynamic Inactivation (PDI)** may be an alternative. PDI consists of the use of a photosensitizer (PS), which absorbs light and, by transferring energy or electrons, excites oxygen molecules, generating free radicals and reactive oxygen species (ROS). These cytotoxic species can then damage cellular and death of biological targets. **Porphyrins and their derivatives are FS molecules and can be used in PDI.**

The aim of the present study was to evaluate the efficiency of PDI in the photoinactivation of *C. truncatum*, *C. cassiicola*, *S. sclerotiorum* and *R. solani*, using a mixture of cationic meso-tetra-aryl porphyrins as PS.

Materials and Methods

Fig. 1- General scheme of the procedures performed in the photodynamic inactivation assays



Conclusion

The mixture of cationic porphyrins was efficient to inactivate the pathogens tested. The results obtained show that photodynamic inactivation therapy can be an important alternative to control diseases caused by *C. truncatum*, *S. sclerotiorum*, *C. cassiicola* and *R. solani*.

References

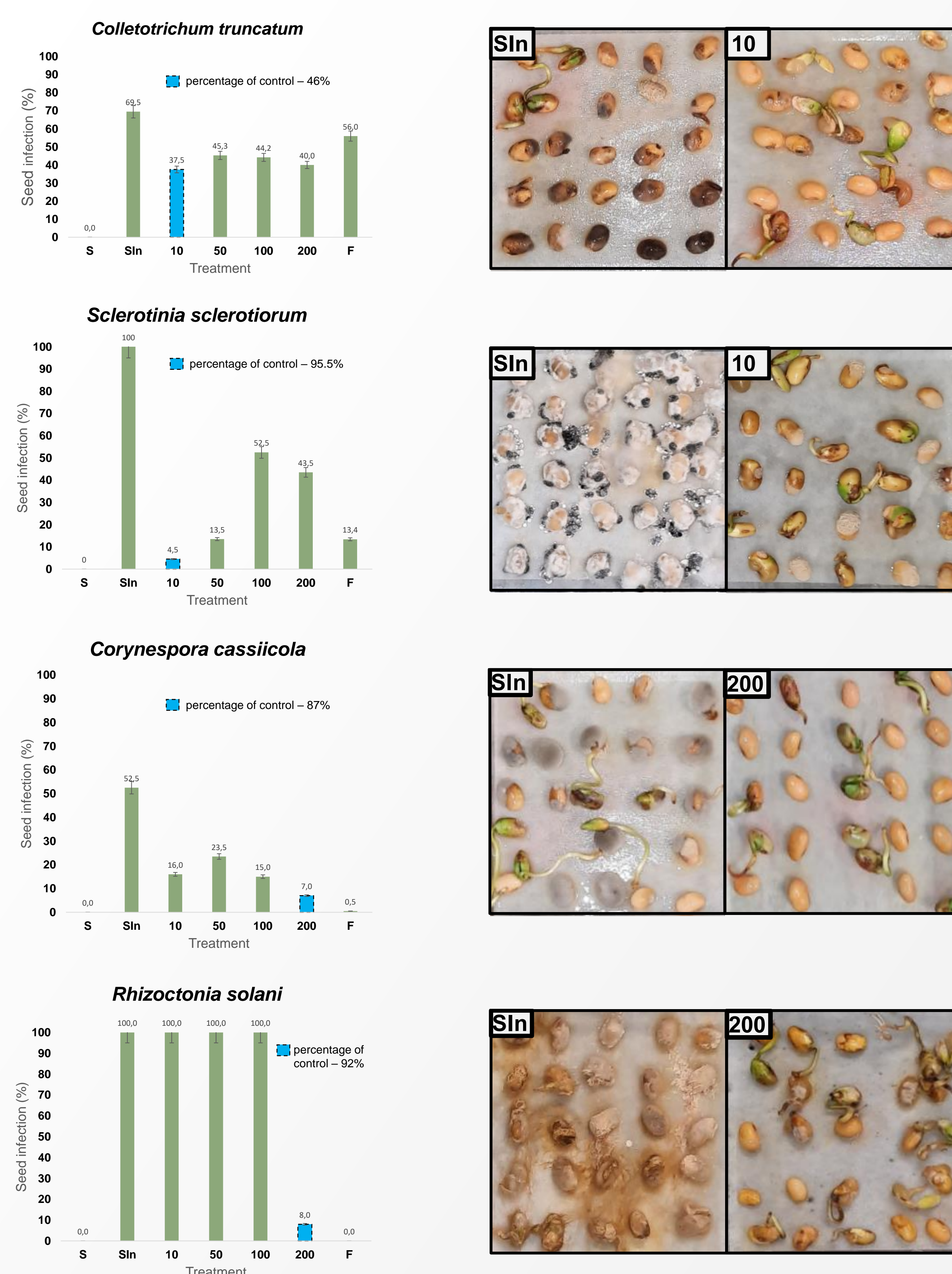
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Results

Photodynamic inactivation assay on soybean seeds artificially inoculated with *Colletotrichum truncatum*, *Sclerotinia sclerotiorum*, *Corynespora cassiicola* and *Rhizoctonia solani*



Seeds: S- without inoculation; Sin- inoculated; 10, 50, 100, 200- treated with PS at these concentrations (µg.mL⁻¹); F- treated with Standard® Top UBS fungicide.