

COMPATIBILITY ANALYSIS IN CROSSING REACTIONS (MATING-TYPE) BETWEEN SMUT FUNGI SPECIES

Pedro Fernando Vilanova Ferreira¹

Gustavo Schiavone Crestana¹

Claudia Barros Monteiro-Vitorello¹

¹College of Agriculture “Luiz de Queiroz”

pedrovilanova@usp.br

Objectives

The biotrophic fungus *Sporisorium scitamineum* causes sugarcane smut disease, one of the most relevant diseases of sugarcane crops. Compatible cells recognize and fuse, giving rise to the infectious dikaryotic hyphae, capable of colonizing the host tissues. After penetrating the plant's surface, colonization becomes systemic and intense proliferation occurs within the host's meristematic tissues. Here, we isolated sporidial haploid cells and assess interspecific sporidial mating *in vitro* among four smut fungi species: *S. scitamineum*, *S. panici-leucophaei*, *Ustilago maydis*, and *Ustilago hordei*.

Materials and Methods

The four species' *in vitro* growth was performed in YM liquid medium containing carbomycin or carbenicillin (250µL) and chloramphenicol (250µL). Serial dilutions were plated in YM and PDA solid medium to isolate single colonies. Mating pairs were prepared by overtopping a 10µL mixture of 5µL drop from each culture. Compatible matings were scored visually by the presence of fluffy white hyphae. Single cells and hyphae were also observed in optical microscopy.

Results

All mating tests between opposite cell types of *S. panici-leucophaei* and *S. scitamineum* showed conjugation hyphae and consequently filament formation at light microscopy (Fig. 1). Also, the isolation of *U. hordei* cell types was made visually, requiring further molecular

analysis. We also identified the mating type of the sequenced genome of *U. hordei*.

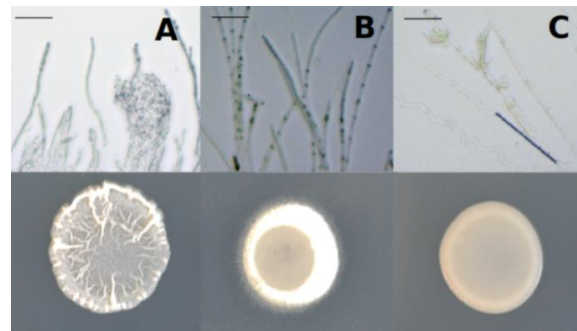


Figure 1: Interspecific hybridization assay between *S. panici-leucophaei* and *S. scitamineum*. A: *Spl* +. B: *Ssci* +. C: Positive interspecific hybridization. Scale bars area 20µM (CRESTANA, 2020).

Conclusions

The study of interspecific hybridization in fungi helps the understanding of the evolution and emergence of new pathogens. This work demonstrated compatible interspecific hybridization reactions among different species, providing useful *insights* for future compatibility experiments with smut pathogens.

References

CRESTANA, Gustavo Schiavone. **The complete genome sequence and comparative effectorome of *Sporisorium panici-leucophaei***: the causal smut disease agent in sourgrass (*Digitaria insularis*). 2020. Dissertation – College of Agriculture “Luiz de Queiroz”, University of São Paulo.