

TITLE: SEARCHING FOR NEW MODELS TO EVALUATE *Cryptococcus*-PLANT INTERACTION

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ABSTRACT:

Cryptococcus gattii is a major cause of cryptococcosis in humans and animals, accounting for high morbidity and mortality rates. Endemic in tropical and subtropical regions, it is associated with a variety of plants. Little is known about how the *Cryptococcus*-plant interaction can influence the adaptation and survival of the fungus in the environment and whether this may impact its virulence in the human host. The objective of this work was to search for a plant model to observe morphological changes related to the interaction between *C. gattii* and plant. Plants of the species *Arabidopsis thaliana*, *Nicotiana benthamiana* and *N. tabacum*, cultivated in substrate, were inoculated with *C. gattii* by scarification, infiltration and dermabrasion methods. The recovery of fungal cells from the plants occurred in the periods of 24h, 7, 14, 21 and 30 days. Initially, the plants were disinfested or not disinfested and then fragmented into stem, inoculated and uninoculated leaf, the fragments were macerated and plated. After incubation, the colony forming units/mL (CFU/mL) were determined. Following the most appropriate method and period for recovery of the fungus, fragments of each plant were ground and suspended in nanquin to visualize the morphology of *C. gattii* cells. Images were generated in the optical microscope to analyze the morphology in ImageJ software. The recovery of the fungus in the disinfested plants was smaller in comparison to the ones not disinfested. The time of 7 days after infection is shown to be the most adequate to obtain *C. gattii* cells. Fungal load recovery occurred in all techniques employed and plant models, but the use of scarification and *N. benthamiana* presented the best results. In relation to the morphology of the fungus, the occurrence of changes in the cell body diameter, capsule thickness and capsule/cell body ratio were evaluated, with a significant difference between *C. gattii* recovered from *N. benthamiana* plants compared to control. For *N. tabacum*, significant differences were observed only in capsule thickness and capsule/cell body ratio, while for *A. thaliana* no morphological changes were observed in relation to control. It was concluded that *N. benthamiana*, inoculated by the scarification method in the 7 day period, was presented as a better strategy for studies with *C. gattii* and that the *Cryptococcus*-plant interaction alters the morphology of the fungus.

Keywords: Cryptococcosis, *Arabidopsis thaliana*, *Nicotiana benthamiana*, *Nicotiana tabacum*.

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