

# Prospecting griseofulvin, a powerful antifungal, in endophytic fungi of the genus *Xylaria* sp. isolated from plant species of Cerrado

Gislaine F. Martins (PG), Geraldo H. Silva (PQ), Vanderlan S. Bolzani (PQ), Angela R. Araujo(PQ)\*

\*araujoar@gmail.com

NuBBE – Nucleus of Bioassays, Biosynthesis and Ecophysiology of Natural Products, State University of São Paulo  
Institute of Chemistry, Department of Organic Chemistry, Zip Code 14800-900, Araraquara, São Paulo, Brazil.

Keywords: endophytic fungi, *Xylaria*, griseofulvin, antifungal.

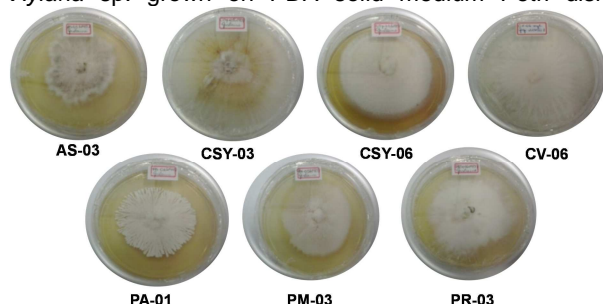
## Abstract

Endophytic fungi are microorganisms that colonize internal tissues and organs of plants such as leaves, stems and roots, apparently healthy and under normal circumstances, would not cause disease, and produce metabolites, which are not only essential for the plant protection but are also important as medicines.<sup>1,2</sup> In this context, griseofulvin, an orally active antifungal drug is obtained from several species of *Penicillium*, *Xylaria*, *Nigrospora*, and others. It is an antifungal drug used for both animals and humans to treat various fungal diseases. Griseofulvin has been used as an antifungal antibiotic for the treatment of mycotic diseases of humans and veterinary animals.<sup>2</sup> Seven endophytic fungi of the genus *Xylaria* sp., isolated from plant species of Cerrado, were studied. These microorganisms were cultivated in liquids medium (Potato Dextrose, Czapek, Yeast Mannitol, Malt Extract and Nutrient) and solids (rice, corn) in small scale, to obtain the crude extracts (n= 49). These extracts were by <sup>1</sup>H NMR and HPLC for detection and quantification of griseofulvin, respectively, using for this purpose standard certified grade purity.

## Results and Discussion

Figure 1 shows endophytes fungi that were identified as *Xylaria* sp. and Table 1 contains the relation of host plant species, family, and the respective identification codes.

**Figure 1.** The isolated endophytic fungi of the genus *Xylaria* sp. grown on PDA solid medium Petri dishes

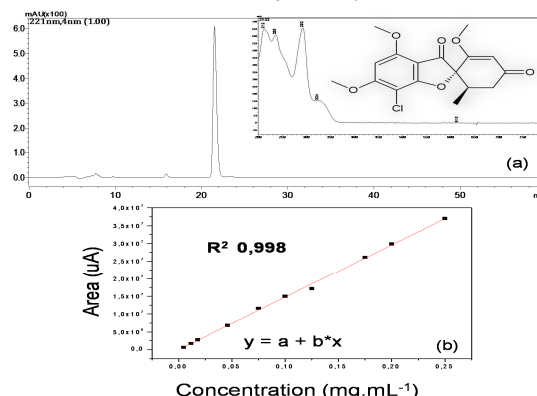


**Table 1.** Endophytic fungi of the genus *Xylaria* sp. and the plant from which they were isolated

Plant species (Family)	Code
<i>Arrabidaea samydoides</i> (Bignoniaceae)	AS-03
<i>Casearia sylvestris</i> (Flacourtiaceae)	CSY-03
	CSY-06
<i>Cupania vernalis</i> (Sapindaceae)	CV-06
<i>Piper aduncum</i> (Piperaceae)	PA-01
<i>Palicourea marcgravii</i> (Rubiaceae)	PM-03
<i>Prunus mirtifolia</i> (Rosaceae)	PR-03

The griseofulvin in crude extracts was detected by comparing the retention time and UV-Vis spectra (Figure 3a) with those of certificated standard under same chromatographic conditions. Following, the analytical curve for quantitative detection was constructed (Figure 3b) and the griseofulvin concentration was calculated.

**Figure 3.** a) Chromatogram of the standard substance, griseofulvin and its UV absorption; b) Calibration curve



## Conclusion

A total of eighteen extracts obtained by four endophytic fungi of the genus *Xylaria* sp. could be quantified; and

The extract that produced the highest amount of griseofulvin was PR-03 when inoculated into Czapek liquid medium, amounting to 9% of the extract.

## ACKNOWLEDGMENTS

CNPq, FAPESP, CAPES and NuBBE.

## References

- Gutierrez, R. M. P.; Gonzalez, A. M. N.; Ramirez, A. M. *Current Medicinal Chemistry*, **2012**, *19*, 2992.
- Rathod, D. P.; Dar, M. A.; Gade, A. K.; Rai, M. K. *Austin J. of Biot. & Bioengineering*, **2014**, *1*(3), 5.