

TITLE: BRAZILIAN *Muscodor* SPECIES ENDOPHYTIC FROM COFFEE AND CARQUEJA PLANTS PRODUCING ANTIMICROBIAL VOLATILES.

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ABSTRACT:

Several endophytic fungi have been reported to have produced bioactive metabolites. Some like *Muscodor* species have the capacity to emit volatile compounds with antimicrobial properties with broad spectrum against human and plant pathogens. The aim of this study was to prospect the *Muscodor* species producing antimicrobial VOCs, in tropical plants used in alternative medicine and coffee plants in Brazil. A total of 11 fungal isolates producing volatile metabolites was obtained by a parallel growth technique using *M. albus* 620 as a reference strain (eight from coffee plants and three from carqueja plants). Phylogenetic relationships revealed the presence of at least three distinct species, *M. coffeanum*, *M. yucatanensis* and *Muscodor* sp. SPME/GC/MS analyses of the VOCs in the headspace above the mycelium from *Muscodor* species 10 days old cultures on PDA revealed the volatile profile emitted by *M. coffeanum* CDA 741, *M. coffeanum* ACJ01, *M. yucatanensis* CDA 736 and *Muscodor* sp. CDA 724. Volatile organic compounds of all *Muscodor* isolates tested had some effect on the growth of at least one of the *Aspergillus* species tested in the test of antimicrobial activity *in vitro*. *M. coffeanum* isolates showed antimicrobial activity against all *Aspergillus* species tested (*Aspergillus ochraceus*, *A. sclerotiorum*, *A. elegans*, *A. foetidus*, *A. flavus*, *A. tamari*, *A. tubingensis*, *A. sydowii*, *A. niger*, *A. caespitosus*, *A. versicolor* and *A. expansum*), sometimes by decreasing the growth rate or for the most part, by fully inhibiting colony growth. Fifty-eight percent of the target species died after six days exposure to VOCs emitted by *M. coffeanum* CDA 741, in addition to the inhibition of growth in *A. ochraceus* inoculated into coffee beans. A discovery of new *Muscodor* isolates, especially in different ecological niches with high activity of competition and antagonism, is a promising source of biological control agent adapted to a particular environment that could be used on a specific site. The total inhibition of growth in *A. ochraceus* in coffee beans by VOCs emitted by *M. coffeanum* CDA 741 opens up a prospect of using this endophytic fungi for the biological control of mycotoxigenic fungi on coffee stored beans.

Keywords: biological control, fungal volatiles, *Muscodor*, postharvest diseases

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