UNIVERSIDAD DE LA FRONTERA

Facultad de Ingeniería y Ciencias Doctorado en Ciencias de Recursos Naturales



**DIVERSITY AND BIOLOGICAL ACTIVITY OF ENDOPHYTIC FUNGI FROM GUARANÁ (PAULLINIA CUPANA VAR. SORBILIS**

**DOCTORAL THESIS IN FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF SCIENCES IN NATURAL**

**RESOURCES**

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**“Diversity and Biological Activity of Endophytic Fungi from Guaraná (Paullinia cupana var. sorbilis)”**

Esta tesis fue realizada bajo la supervisión del director de tesis, Dr. Cledir Santos del Departamento de Ciencias Químicas y Recursos Naturales de la Universidad de la Frontera y ha sido aprobada por los miembros de la comisión examinadora.

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**Thesis summary**

The study explores endophytic fungi within guarana plants, investigating their relationship with the host and their potential for producing secondary metabolites with biotechnological applications. The microbiota analysis in susceptible and tolerant genotypes from distinct locations revealed a diverse composition, with beneficial genera like Aspergillus and Phomopsis alongside potentially problematic ones like Colletotrichum and Fusarium. Some isolated fungi exhibited promising traits, producing anthraquinones and enzymes useful in various industries. Notably, certain isolates displayed antagonistic behavior against Colletotrichum guaranicola, a significant pathogen affecting guarana. These findings lay the groundwork for future research harnessing the bioactive potential of guarana-associated microorganisms for medicinal, agricultural, and industrial purposes. Understanding the endophytic community's structure and diversity may also aid in enhancing guarana crop productivity and disease management strategies.