

## **Título: ANTIMICROBIAL AND ANTIOXIDANT POTENTIAL OF MELANIN OF BLACK YEAST ISOLATED FROM DIFFERENT ECOLOGICAL NICHES IN SANTA CATARINA, BRAZIL**

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### **Abstract:**

Black yeasts like fungi (BYLF) from the family Herpotrichiellaceae (order Chaetothyriales) are Ascomycetes that can adapt to adverse environmental conditions. They are widely distributed in different habitats with active growth in extreme ecological niches, living with basic sources of nutrition and energy, low humidity, high temperatures and resistant a sunlight incidence, due to the presence of melanin. This pigment is formed by the oxidative polymerization of the phenolic compound 1,8-dihydroxynaphthalene. Probably the diversity of these yeasts favors the existence of physiological properties whose biotechnological potential and applications are promising. The aims of this study were to investigate the antimicrobial activity of melanin extracted from BYLF isolates against different pathogens, and their antioxidant potential based on resistance to the oxidative stress. Sample of arabble soil parts of plants or roots, liquid effluent timber or from pasty dairy effluent were processed based on flotation technique in mineral oil, and Solid state-like batch culture technique. The isolates were subcultured on different agars media: Malte Extract, Mycosel and Potato Dextrose, with the antibiotics chloramphenicol and cycloheximide (incubated at 28°C±0.2°C). DNA extraction, sequencing and molecular profiling were realized according Vicente et al. (2008). Melanin samples were extracted by KOH treatment and acid hydrolysis. Antibiotic activity of melanin was assayed by agar disk diffusion method using the indicators microorganisms: *Tatumella ptyseos* ATCC 11468, *Campylobacter jejuni*, *Enterococcus faecalis*, *Salmonella enterica* Typhi, *Burkholderia* sp., *Staphylococcus aureus* ATCC 25923, *Pseudomonas aeruginosa* and *Escherichia coli* ATCC 25922. The antioxidant potential of melanin was analyzed based on scavenger activity of free radicals (2,2-difenil-1-picirilhidazila-DPPH). The molecular identification indicated that the BYLF strains belong to the genus *Exophiala* and are grouped separately from other described taxonomic groups, but are related to specie *E. alcalophila*. All isolates had inhibitory action, but the strains LMICRO 789, LMICRO 792, and LMICRO 797 had better activity against greater number of pathogens. The melanin's showed ability to reduce DPPH particularly those from strains LMICRO 787 and LMICRO 789. We conclude that there is a great biotechnological potential of these melanin obtained from non-pathogenic BYLF related to antimicrobial and antioxidant activity.

**Keywords:** Black yeast, Melanin, DPPH, Inhibition.

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