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021- TOWARDS THE DESIGN OF STABLE AND EFFECTIVE DYE-DECOLORIZING CONSORTIA OF EDIBLE FUNGI

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Synthetic dyes are used in textile industries due to their advantages over natural dyes. However, textile effluents cause irreparable damage to water bodies because of the proper toxicity of textile dyes or by reducing the penetration of visible light leading to the eutrophication rivers and lakes. Aerobic biodecoloration is an interesting treatment alternative for these effluents. However, no microorganism is capable of degrading all existing dyes, making the use of microbial consortia mandatory. Wood White Rot fungi produce enzymes such as Laccase, Manganese Peroxidase or Lignin Peroxidase that have been widely used for the degradation of textile dyes. The objective of this work was the selection of compatible edible fungi for the formation of consortiums capable of degrading different colorants. For this, we selected ten *Pleurotus, Psilocybe, Ganoderma* and *Lentinula* strains. Fungi were maintained in Petri dishes with 20 mL of solid YM medium (glucose: 1%, soy peptone: 0.5%, yeast extract: 0.3%, malt extract: 0.3%, agar: 1.8%), incubated at 25°C. Media were inoculated with 5 mm diameter plugs obtained from growths in solid YM medium, preincubated for 7 days at 25°C. The laccase production of the different fungi was evaluated in solid media using eight substrates: 2,2-Azino-bis(3-ethylbenzothiazoline-6-sulfonic acid (ABTS), catechol, 2,6-dimethoxyphenol, 1-naphthol, benzidine, syringaldazine, 3,4-dimethoxybenzylalcohol, and guaiacol. Assays in which oxidized substrates produced haloes of different colors around the wells were considered positive. To carry out the compatibility tests, the ten strains were confronted with each other on different plates with YM solid medium in duplicate and incubated for 7 days at 25°C. Four modes of interaction were observed: inhibition haloes, zone with a dark line (in the contact of one strain with the other the line is produced), overgrowth (invasion of one strain on the other) and growth without inhibition. For the evaluation of the bleaching capacity of each strain, four industrial textile dyes were used: Black Vilmafix® B-V, Blue Vimafix® RR-BB, Red Vilmafix® 7B-HE and Orange Procion® HER, which were seeded in four wells made in the plates of each strain forming halos of each color. After 24 hours of incubation at 25°C, different levels of degradation were observed around the haloes depending on the structure of the dye. The results show that the tested fungi could be employed in the design of effective dye decolorizing consortia.

022- ASSESSING THE TEXTILE-DYE DECOLORIZATION POTENTIAL OF PSYCHROPHILIC AND PSYCHROTOLERANT YEASTS FROM 25 DE MAYO/KING GEORGE ISLAND (ANTARCTICA)

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Antarctic environments typically present low temperatures, high solar radiation and low nutrient availability, being one of the harshest environments on Earth. Psychrophilic and psychrotolerant yeasts from Antarctic soils and cryoconites have adapted to such conditions, being an interesting source of new enzymes with great biotechnological potential. This work intends to prove the textile dye decolorizing potential of 139 yeasts isolated from soil and cryoconite samples from 25 de Mayo / King George Island, Antarctica. Isolates were cultivated in YM, and NDM (Normal Decolorization Medium) media at 15, 20 and 25°C, and classified into psychrophilic and psychrotolerant according to their growth profiles. Textile dye decolorization was evaluated in the same two media, plus 200 mg/L of one of four commercially available reactive azo dyes: Vilmafix® Blue RR-BB (CI, Reactive Blue 221), Vilmafix® Red 7B-HE (CI, Reactive Red 141), Vilmafix® Black B-V (CI, Reactive Black 5), or Vilmafix® Green RR-4B (CI, Reactive Green). Plates were incubated for 72 h at 15, 20 or 25°C, depending on the yeast isolate. Dye decolorization haloes and colony dyeing were recorded daily and used to select the most promising isolates. Of 139 isolates, 34% were classified as psychrophilic (growing only at 15°C) while the remaining 66% were classified as psychrotolerant (growing at all the assayed temperatures), irrespective of the medium assayed. Forty-five isolates produce haloes in at least one of the tested dyes in NDM, while only 40 yeast produced haloes in YM. 15 isolates were selected for further studies Isolates A075 and Y28D produced intense haloes without colony dyeing; isolates Y67, Y70 and Y75 produced intense haloes and get dyed only at the edge of the colonies while the remaining ten isolates, A092, A099, A104, A105, A106, A107, Y6, Y59, Y73 and Y84, produced neat haloes with a significant colorization of the entire colonies. The obtained results prove the biotechnological potential of Antarctic yeasts, raising the possibility of designing more efficient dye-decolorizing methods at low temperatures.