TÍTULO: DECOLORIZATION AND TOXICITY SCREENING OF TEXTILE DYES BY YEASTS

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Resumo:

The textile industry produces a multi-component waste, which can be difficult to treat. There are many effective wastewater treatments, however these technologies are highly expensive. Biological treatments that have been conventionally applied present certain drawbacks because in some cases microorganisms can transform dyes into compounds more toxic than the original compound. For this purpose some toxicological assays can be applied, including tests using microcrustacean *Artemia salina*, routinely used to determine toxicity of chemicals for the establishment of environmental health standards. Thus, the aims of the present study were to investigate the ability of different yeasts to decolorize two textile dyes, as well as the determination of their toxicity before and after treatment using the ecotoxicological assay with *Artemia salina*. The dyes used in the investigation were Remazol Brilliant Blue R (RBBR) and Orange G. The yeasts isolates used in this work, was previously isolated from Rio Subaé in Bahia State, Brazil, an area of estuarine habitat. Decolorization experiments were performed in Erlenmeyer flask with 150 ml of sterile Normal Decolorization Medium (NDM). Among 72 yeasts tested to decolorization dyes, only three isolates (SF4, SD5, OJU1) were able to decolorization Orange G at 100 ppm and five (OJU2, SLJL6, SF5, SJ10, SJU5) to RBBR at 25 ppm. The acute toxicity tests consisted of exposing the *Artemia salina* newly hatched in a saline solution, to the different concentrations of the dye before and after biodegradation. The biodegradation occurred in a period of 24 and 120 h at 25 °C. The supernatant were tested in a concentration series (100, 50, 24, 12 and 6 %). After 24 h of incubation, the number of dead larvae was counted. The tests were carried out in triplicate. In acute toxicity analysis was detected lethal toxic effect for the dyes after and before treatment. However, the isolate SD5 was able to reduce the toxicity of the treated Orange G with an average lethal concentration (LC50) of 17,19% and 11,2 % in 24h and 120h respectively. For RBBR, after treatment two isolates was able to reduce the toxicity. The isolate SJ10 showed a LC50 of 19,5% in 120 h, while in 24 h there was no reduction in toxicity. The isolate SJU5 showed a LC50 of 14,2% and 20,8% in 24h and 120h respectively. The results showed that there was change in the acute toxicity depending on the incubation time, the dye and the yeast used in decolorization.

Palavras-chaves: biodegradation, bioassay, fungi

Agência Fomento: Capes e Fapesb