DECOLORIZATION OF BASIC BLACK OM BY *Trametes versicolor* IN A FLUIDIZED BED REACTOR

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Introduction. Dyes used in several industries, like textile, mean an environmental problem due to their high stability (1). For the dyes removal process researchers have preferred the use of microorganisms with a high potential for biodegradation. Among them, white-rot fungi are capable to degrade a wide range of recalcitrant xenobiotic compound, including dyes (2). The aim of this work was to evaluate the removal efficiency of dye Basic Black OM (BB-OM) by *Trametes versicolor* immobilized in polyurethane foam cubes in a fluidized bed reactor.

Methods. A glass column (60 cm high; 6cm diameter) was used as fluidized bed reactor, containing 1 L of Radha medium (3) and 250 PFC colonized by *T. versicolor* (4). The reactor was operated in a sequencing batch mode at room temperature during 103 days, using different initial concentrations of BB-OM which were aggregated sequentially: when dye had almost been completely consumed, the content of reactor was exchanged by fresh medium containing higher dye concentration than the previous one, and the degradation process started again. At the end of this period, viability test was conducted for checking the ability of immobilized cells to consume glucose, adding fresh medium without dye. Dye concentrations were measured photometrically at 618 nm and residual glucose at the beginning and end of the operation was evaluated by DNS.

Results. During the operation of the reactor at the beginning of the process two trials of glucose consumption was achieved (Fig. 1), which showed a similar profile, although glucose consumption rate decreased slightly in the second one. In the removal assays conducted later (Fig. 2) there was an increase in dye removal using between 60 and 205 ppm of BB-OM, meanwhile when dye concentrations was higher than 205 ppm, inhibitory effect on microorganism activity was observed. The changes in the absorption spectrum for all dye concentrations tested (data not shown) suggested that the BB-OM structure was transformed during the process.

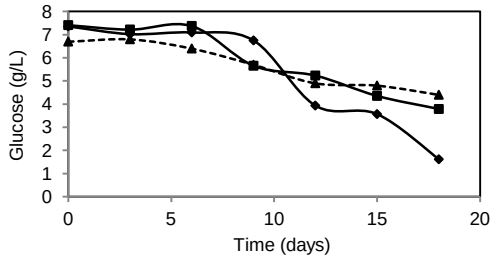

Fig.1 Residual glucose in fluidized bed reactor first assay (♦) and second assay (■), before sequential discoloration test, and at the end of the test (▲).

After 103 days of continuous microbial activity, *T. vesicolor* retained 37% of the activity of glucose degradation when it was compared with the first trial.

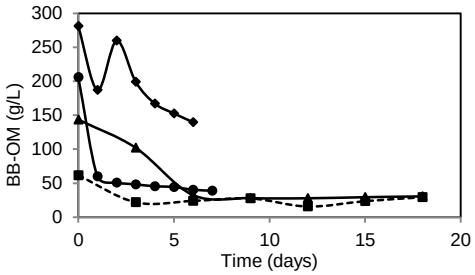

Fig.2 Residual BB-OM in sequencial fluidized bed reactor with 60 (■), 140 (▲), 205 (●) and 280 ppm (♦) of dye.

Conclusions. Foam immobilized *T. versicolor* allowed operated the fluid bed reactor continuously for 103 days, keeping at the end of the assay 37% of the initially glucose degradation activity observed. In the assayed conditions BB-OM concentrations greater than 280 ppm had an inhibitory effect on *T. versicolor* activity.

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