



GROWTH ON DIBUTYL PHTHALATE OF FUNGI ISOLATED FROM A PAPER INDUSTRY: TOXICITY OF ITS DEGRADATION COMPOUNDS

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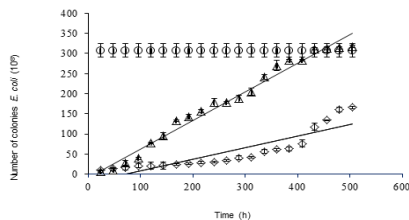
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Introduction. Phthalate are plasticizers widely used in the manufacture of plastics and are often discharged by the paper and plastics industries during the manufacturing processes into de ecosystem, contributing to the environmental pollution. Dibutyl phthalate (DBP) is one of the most widely used phthalates and it is mutagenic, carcinogenic and teratogenic¹. In this work was to evaluate the growth of filamentous fungi on DBP and to determinate the toxicity of their degradation compounds.

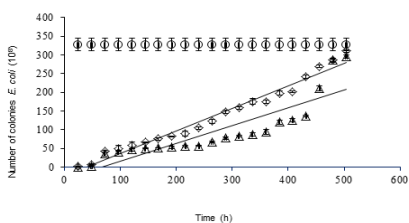
Methods. Radial (μ_r)², specific growth (μ) rates³ and biomass³ of *Neurospora* sp, *Trichoderma harzianum* and *Aspergillus niger* were evaluated in media containing mineral salts (SM) and different concentration of DBP (mg/l): 1) medium containing SM (without DBP), 2) 500 of DBP+SM and 3)1000 of DBP+SM. The toxicity of breakdown products of DBP was evaluated by counting viable colonies of *Escherichia coli* grown on R2A agar containing the supernatant of each fermentation.

Results *Neurospora* sp, *T. harzianum* and *A. niger* were able to grow on DBP-containing media. *Neurospora* sp had higher μ_r compared to the other two fungi. *A. niger* had higher biomass and *T. harzianum* had higher μ . The pH of the culture media was decreased as time increases fermentation. IC₅₀ of DBP was 473 mg/l. The breakdown products of DBP were not toxic to *E. coli*.

a)



b)



c)

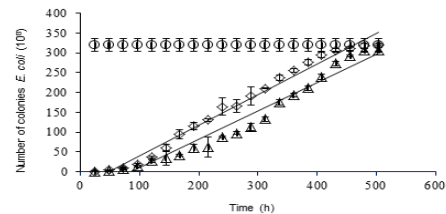


Fig. 1 Number of colonies of *E. coli* grown on the supernatant of cultures of *Neurospora* sp (a), *T. harzianum* (b) and *A. niger* (c) in 1000 mg/l of DBP (◆), 500 mg/l of DBP (▲) and without phthalate (●) under submerged fermentation conditions

Table 1. μ_r and biomass of *Neurospora* sp, *T. harzianum* and *A. niger* grown in different concentration of DBP

Strain	Culture media					
	Without phthalate		DBP (mg/l)			
	μ_r (mm/h)	Biomass (mg/ml)	μ_r (mm/h)	Biomass (mg/ml)	μ_r (mm/h)	Biomass (mg/ml)
<i>Neurospora</i> sp	1.07 ^a ±0.02	0.06 ^d ±0.03	1.31 ^b ±0.02	0.12 ^c ±0.05	1.31 ^b ±0.00	0.12 ^c ±0.02
<i>Trichoderma harzianum</i>	0.74 ^a ±0.02	0.16 ^c ±0.02	0.56 ^b ±0.01	0.08 ^d ±0.00	0.57 ^b ±0.00	0.06 ^e ±0.03
<i>Aspergillus niger</i>	0.33 ^a ±0.00	0.12 ^c ±0.04	0.72 ^b ±0.02	0.12 ^c ±0.12	0.69 ^b ±0.01	0.13 ^c ±0.12

Means with the same letter within a row are not significantly different. Data were evaluated ANOVA and Tukey test (P<0.01). Numbers in parenthesis correspond to SD of three separate experiments.

Conclusions. *Neurospora* sp had higher μ_r and biomass than the other strains in media containing DBP. This strain degraded DBP to compound less toxic since the amount of colonies were positively correlated to the fermentation time

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References.

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