BIOLOGICAL DEGRADATION OF LIQUORS OBTAINED FROM JONOTE SOFTENING PROCESS BY *Trametes versicolor*

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Key words: xylanases, laccases, amate paper

Introduction. Pulp and paper industry generates contaminated effluents which represent an economical and ambient problem[1]. These effluents, generated during the softening and bleaching processes of pulps contain high quantities of lignin and derivates, which are recalcitrant compounds and consequently highly contaminant[2]. For its elimination, several oxidative and precipitating techniques are used, which provoke an additional chemical charge to the environment. So, a treatment using biological methods has become a good alternative for an effective reduction of liquor color and the generation of friendship and economical processes[3]. The objective of this work was to evaluate the ability of *Trametes versicolor* for degrading liquors obtained from jonote softening process, previous to amate paper obtention.

Methods. Jonote pulp (8% consistency) was softened using 3 experimental conditions: treatment with laccases (10U/g_{pulp}), xylanases (10U/g_{pulp}) or chemical compounds (4N NaOH + 4N H_3ClO). Resultant liquors were divided proportionally and equal quantities of water (C), water with 0.0149 g of mycelium (S/G) or glucose solution (final concentration of 100 g/L) with 0.0149 g of mycelium (C/G) were added on each case. All were incubated during 10 days at ambient temperature and 200rpm, recovering the treated liquors by filtration. These were analyzed by recording its optical density at 280 (residual lignin) and 480 nm (residual phenolic compounds), as much as the reducing sugar (RS) content. Biomass was evaluated by dry weight technique.

Results. Jonote pulp obtained after the enzymatic treatment shown the lowest values of kappa number (a lignin content indicator) and the highest pulp yield (Table 1), which indicates the potential of enzymes for the softening and bleaching processes and its advantage over the chemical one. Glucose addition did not seem to aid significantly the process in order to diminish ligning and phenolic compound content of liquors obtained from enzymatic treatment, but it did help to degrade the liquors obtained after chemical treatment (Table 2).

Table 1. Characteristics of Jonote pulp after enzymatic (laccases + xylanases) or chemical (NaOH + H_3ClO) treatment.

	Initial value	Enzymatic treatment	Chemical treatment
Kappa No.	29.4	1.78 ± 0.17	13.57 ± 1.38
Yield (%)	--	88.54 ± 0.03	25.41 ± 0.005

Microbial treatment of liquors showed a good removal of all species, although this process was better for liquors obtained with enzymatic treatment (54% vs 8% for those obtained by chemical treatment). Glucose addition favored this removal only for liquors obtained by chemical treatment, as much as the biomass production in all the cases.

Table 2. Characteristics of liquors obtained after treatment with *T. versicolor.*

	Exp	Enzymatic treatment Laccases	Enzymatic treatment Xylanases	Chemical treatment
O.D 280nm	C	7.93 ± 0.05	4.1 ± 0.03	4.65 ± 0.21
	S/G	3.63 ± 0.14	2.36 ± 0.01	4.25 ± 0.5
	C/G	3.70 ± 0.04	3.41 ± 0.77	3.75 ± 0.07
O.D 480nm	C	0.4 ± 0	0.55 ± 0	1 ± 0
	S/G	0.24 ± 0.01	0.19 ± 0.01	0.7 ± 0.28
	C/G	0.29 ± 0.01	0.35 ± 0.08	0.35 ± 0.07
R.S (g/L)	C	1.41 ± 0.06	0.99 ± 0.08	0.0728 ± 0
	S/G	0.10 ± 0	0.073 ± 0	0.0728 ± 0
	C/G	63.34 ± 0.19	82.72 ± 5.1	59.03 ± 9.0

Conclusions. *T. versicolor* has a good feasibility in the treatment of liquors from pulp and paper industry for diminishing the corresponding contaminant charge, which highlight the importance of these procedures at industrial and environmental level.

Acknowledgements. SLS thanks to CONACYT for the scholarship.

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