



POLYMETHACRYLATE DEGRADATION BY BACTERIA ISOLATED FROM PAPER RECYCLED INDUSTRY IN CHIHUAHUA MEXICO.

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Introduction. In the paper recycling process from fiber board, the presence of contaminants affects considerably the effectiveness of paper production (Kraft paper). These materials known as stickies due to their adhesive behavior are composed mainly of cellulose, lignin, ashes and polymers such as poly methyl acrylates (PMAC) [1]. Methods of preventing the build-up of stickies on the paper process are of main importance to its manufacturing. Enzymes also are known to be effective as contaminant control agents in papermaking systems [2]. Actually, there is no report on the use of endogenous bacteria for stickie control [3].

The principal aim of this work was to isolate bacteria, directly sampled from a paper recycling factory, with esterase and lipase enzymatic activities, evaluated for the degradation of PMAC.

Methods. In the first part of the study, stickies and water samples from the paper production process were inoculated in M9 (salt enriched) media under agitation for 7 days. Then, they were transferred to the following media: M9, M9+ 0.1% yeast extract and M9+0.2% glucose; and incubated under agitation at 25° C for 4 days. For isolation of pure culture, samples were plated into TSA agar plates and incubated at 37°C for 1 day. Pure cultures were obtained from the inoculated plates and they were preliminary identified by Gram stain, catalase and oxidase; and corroborated by their morphological growth. Selective media were used for screening of pure isolates for PMAC degradation, using the following media: M9, Baird Parker and tributiryn media stained with methylene blue, for poly methyl acrylate degradation. Cellulolytic bacteria were identified by the carboxy methyl cellulose method using Congo Red stain

Results. From a total of 6 water samples and 12 stickies obtained from different points of the paper production process, a total of 121 bacteria strains were isolated. By the tests performed, 22 bacteria strains were selected presenting lipase and esterase activities for poly methyl acrylate degradation. Those with cellulolytic activity were discharged. These bacteria were initially identified as belonging to the *Pseudomonas* or *Bacillus* genus (Figure 1).

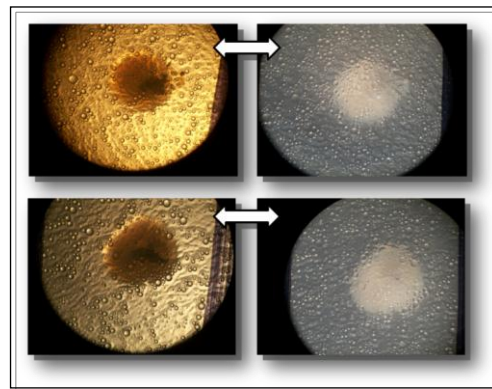


Figure 1. Morphological growth for strains in tributiryn media.

Conclusions. In conclusion, bacteria isolated from the paper production process are adequate for poly methyl acrylate degradation, as one of the main components in stickie samples.

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