TITLE: SCREENING OF BACTERIA ISOLETED FROM SOIL THAT METABOLIZE XYLOSE AS A POTENTIAL FOR ETHANOL PRODUCTION

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ABSTRACT:

Ethanol is a renewable fuel that can be produced from agricultural waste like corn husk and sugarcane bagasse through a combination of physical or chemical treatments, enzymatic hydrolysis to extract the sugars from the lignocellulosic biomass and by co-fermentation. Biomass from agricultural waste is one of the most abundant and cost-effective renewable raw materials. Lignocellulosic material is composed of lignin, cellulose and hemicellulose, which during the process are transformed into pentoses such as xylose and glucose, and can be used as a substrate in fermentative processes. Although some industrial microorganisms like *Saccharomyces cerevisae* efficiently ferment hexoses, it is not able to ferment pentoses. Thus, this work aimed to select bacteria that metabolize xylose. Bacterial strains isolated from soil were used to evaluate the ability to metabolize in medium with different concentrations of xylose (2%, 3%, 4% and 5%) as a source of carbon in YEPX medium (1% yeast extract, 1% peptone) at 30 ° C 100 rpm. Samples were removed at pre-set intervals for cell growth (DO 600nm) dosages. After the selection, fermentation with the best strain and the best concentration of xylose was carried out. The fermentation was carried out with agitation (100 rpm) and without agitation at 30 ° C for 36h. Among of nineteen strains used all were able to grow in medium xylose at all concentrations. However, it was observed that the best concentration was 2%. Six of the nineteen strains were selected with the best strains for the fermentation (*Bacillus* sp TD-DT7, *Paenibacillus* sp TD-DT8, *Bacillus* sp TD-DT13, *Bacillus* sp TD-DT64, *Bacillus* sp TD-DT81 and *Bacillus* sp TD-DT139). There was no significant difference between the fermentative process with agitation and without agitation. The present study demonstrated the biotechnological potential of isolated strains of *Bacillus* spp. and *Paenibacillus* sp., capable of metabolizing xylose by fermentative processes.

Keywords: biofuel, xylose, hemicellulose, pentose, soil bacteria.

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