PRODUCTION OF LACTIC ACID IN NATURAL AND SYNTHETIC MEDIA BY A *LACTOBACILLUS SP.* ISOLATED FROM SOURED MILK

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A strain of *Lactobacillus sp.* was isolated from soured milk in our laborarory for lactic acid production. The bacteria was isolated based on the morphological characteristics, gram positive staining and the specificity of lactic acid for LDH. All the experiments with *Lactobacills sp.* were carried out at room temperature in static culture. The strain cultivated in milk containing $60gl^{-1}$ total sugar produced $23gl^{-1}$ lactic acid at 36h, with 80% substrate utilization. However when the pH was maintained by the initial addition of $CaCO_3$, the the lactic acid production increased to $34.5gl^{-1}$, which corresponds to a 12% increase in the efficiency of lactic acid production In the rest of the experiments pH was maintained by the initial addition of $CaCO_3$ ($60gl^{-1}$). As the quantity of lactic acid produced from milk ($34.5gl^{-1}$) was not sufficient for down-stream processing of lactic acid economically, it was decided to supplement milk with different sugars to a total concentration of $150gl^{-1}$. Among glucose, sucrose and lactose, the organism performed best in the lactose supplemented media in respect to lactic acid ($43gl^{-1}$) production This preference of lactose utilization may be due to the *Lactobacillus sp.* having the enzymes for lactose metabolism. As the proteins of milk are not used up in the fermentation, milk could be substituted with whey. Therefore further studies were carried out with whey as the fermentation medium. In whey the total sugar was $30gl^{-1}$ and the organism fermented 86.7% of the total sugar and produced $14.5gl^{-1}$ lactic acid at 24h. To compare lactic acid production in whey and milk, whey medium was suplemented with $30gl^{-1}$ lactose to bring the total sugar level to $60gl^{-1}$. At 36h, in whey medium supplemented with lactose, $29gl^{-1}$ lactic acid was produced with 86% substrate utilization As a control, *Lactobacillus sp* was cultivated in synthetic culture media containing different sugars. The organism preferred the synthetic medium containing lactose in preference to other sugars. A delay (12h) in attaining maximum lactic acid production in synthetic medium was observed when compared with milk and whey medium. Since the organism was isolated from soured milk and the inoculum was prepared in milk the organism might have been adapted to milk and whey. This could be one of the reasons for the delayed lactic acid production in the synthetic medium or else the medium may be deficient or lacking one or more of the essential nutrients needed for lactic acid production by the organism.