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PASTRA KEMAVUTHANON : BIOMETHANATION BY MIXED CULTURES OF ACETOGENS AND METHANOGENS ISOLATED FROM SLUDGES OF DAIRY INDUSTRY.
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Mixed cultures from sludges of dairy industry including, Acetogens, a bacterial group using propionic acid or lactic acid as a selective substrate; and, Methanogens, using methanol or $H_2$:$CO_2$(80:20) as selective substrate were isolated. After six week-incubation of mixed cultures of Acetogens and Methanogens at a ratio of 1:1 at 37°C high quantity of methane production of $2.0 \times 10^5$ nmole was obtained. This optimal production was from Acetogens isolated by using propionic acid and Methanogens by using methanol or $H_2$:$CO_2$(80:20) as selective substrate cultivated in a medium containing 5 mM lactic acid with sand as a carrier matrix and subsequent addition of $H_2$:$CO_2$(80:20) in the second week of cultivation. Interestingly, the highest quantity of methane production of $2.97 \times 10^5$ nmole was observed with the mixed cultures at a ratio of 1:1 of Acetogens isolated by using lactic acid and Methanogens by using methanol or $H_2$:$CO_2$(80:20) in the medium containing 10 mM lactic acid using sand as a carrier matrix with subsequent addition of $H_2$:$CO_2$(80:20) in the second week of cultivation and at the same time. It was observed that final pH of both conditions are consecutively 6.65 and 6.74 which are optimal for Methanogens growth.