

### Caffeine degradation by *Brevibacterium Sp.*

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#### ABSTRACT

Caffeine (1, 3, 7-trimethylxanthine) is a commercially important purine alkaloid synthesized by plants. Environmentally, caffeine has been suggested as a chemical indicator of ecosystem since it is difficultly metabolized. When the exposure dosage of caffeine in water was higher than 300mg L<sup>-1</sup>, no zebra fish embryos could survive, and caffeine treated embryos exhibited significantly reduced tactile sensitivity frequencies of touch-induced moment even when exposure dosages were very low. It leads to ecological pollutions and becomes a big disposal problem. The average Caffeine intake is found to increase annually in India by the uptake of coffee, cola and other beverages which serves as the main source of caffeine. It stimulates the Central nervous system, increases the contraction power of the heart, widens the vessels of heart, kidney and the skin and exhibits broncholytical and diuretical actions when taking it in limited amount. If overdose, it leads to restlessness, nausea, headache, tense muscles, sleep disturbances, and irregular heartbeats. So, the process of decaffeination is necessary to reduce the caffeine content in coffee pulp and husk. Conventional decaffeination techniques like solvent extraction or use of supercritical carbon dioxide can be expensive, toxic to the environment and non-specific. So there is a strong need for caffeine degradation by alternative routes other than conventional techniques. The potential use of microbes and their enzymes is an attractive alternative as it is cheap, easier and faster. The present study deals with the biodegradation of Caffeine by the selected isolate *Brevibacterium*. The growth and caffeine degradation were recorded as the increase in biomass by weight via Spectrophotometer and residual caffeine analysis by HPLC. The growth of *Brevibacterium* was recorded for every 12 hours and was found to increase as 2.653, 4.678, 4.532, 4.859 and 3.892. The degradation of caffeine for every 12 hours was analyzed and found to decrease from initial concentration to 82.6, 64.42, 45.84, 11.06 and 5.92 at 24,36,48,60 and 72 hours respectively.

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