PROJECT REPORT
ON

ELECTRICITY GENERATION FROM ETP WASTE AND IDENTIFICATION OF MICRO ORGANISMS COUPLED WITH WASTE WATER TREATMENT

PROJECT ASSOCIATES

DEEPTHI SUPRABHA
(4NM04BT010)

GOKUL A RAO
(4NM04BT012)

ARCHANA
(4NM05BT005)

KARTHIK B V
(4NM05BT020)

SHILPA P. PRABHU
(4NM05BT068)

UNDER THE GUIDANCE OF
Dr. UJWAL P.
Senior Lecturer

Submitted to the Vishveswariah Technological University, Belgaum in partial fulfillment of requirement for the award of Bachelor of Engineering degree of Biotechnology.

2008 – 09

DEPARTMENT OF BIOTECHNOLOGY ENGINEERING
NITTE MAHALINGA ADYANTHAYA MEMORIAL
INSTITUTE OF TECHNOLOGY
NITTE - 574 110, UDUPI DISTRICT

SYNOPSIS

It is evident that human kind is independent on energy with advancement in science and technology. The present day energy scenario around the globe is precarious, thus driving the search of alternative to fossil fuels and other exhaustible sources of energy.

Increasing energy demand creates unbalanced energy management and requires power source that are able to sustain for longer periods. Trapping renewable energy from waste organic source is the present trend of active research.

It is reported that micro organisms can convert organic matter into electricity using microbial fuel cell. A microbial cell is a device that converts chemical energy into electrical energy. A typical MFC consists of an anode and a cathode chamber connected by a salt bridge. Here anode was maintained at anaerobic condition and cathode was maintained under aerobic condition. The two compartments were separated by the proton exchange membrane.

In our present investigation the anode was filled with ETP waste and the cathode was filled with buffer. Both anode and cathode were maintained at aerobic condition considering the economy and the feasibility of the work. The proton exchange membrane was replaced by the agar salt bridge which facilitated the easy flow of proton through the pore. At anode the ETP waste will be oxidized by the microorganisms generating protons and electrons. Electrons move to cathode through external circuits and protons through the salt bridge. The voltage and the current generated were measured. Copper-Zinc electrode system of MFC was found to be effective and gave a maximum of 0.97 V and 0.034 A. The effect of *Escherichia coli* and *Saccharomyces cerevisiae* on electricity generation was studied of which *Escherichia coli was* found to be an ideal microorganism for electricity generation

The microbes responsible for the electricity generation were screened by various biochemical tests. *E-Coli, Proteus vulgaris, Pseudomonas aeruginosa, Enterobacter aerogenes* and *Proteus mirabilis* were screened.

In industries, ETP waste water was treated by chemical methods which were hazardous to the environment. A preliminary investigation on the coagulative ability, pH and COD consequence of leaves of *Moringa oleifera* (Drumstick), *Ficus religiosa* (Peepul) and *Azadirachta indica* (Neem) and alum (Aluminium sulphate) on the waste water samples from the pharmaceutical industry was done. Varying weights (2g to 10g) of dried pulverized plant leaves and alum were treated with 250ml of waste water sample and kept for 24hrs.*Moringa oleifera* leaves exhibited better coagulative effect, reduced the COD significantly and appreciable effect in the pH reduction comparable to alum, *Ficus religiosa* and *Azadirachta indica* leaves. These preliminary studies not only suggest alternative and cheaper waste water purification methods for the pharmaceutical industries but also suggest good starting materials for the synthesis of environment friendly natural coagulants.