

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**



**A Project Report**

**on**

**ECO-ENGINEERED TREATMENT OF COFFEE PROCESSING  
WASTEWATER**

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## **Abstract**

The coffee grain processing industry is one of the major agro-based industries in India. The wet coffee processing generates enormous quantities of high strength wastewater which is acidic, deoxygenated and over laden with suspended solids and dissolved organics from pulp and mucilage. The traditional practice is to simply discharge the wastewater into nearby stream or river which affects the quality in the neighbouring downstream. The pollution potential of wastewater and increasing water demand highlight the need to develop technically viable and environment friendly wastewater treatment technology that allows the reduction of pollutants and reuse of wastewater.

The present study aimed at treating the coffee processing wastewater using Up-flow anaerobic fixed bed reactor followed by aeration. Inexpensive and easily available materials viz., jute coir, Mangalore tiles and plastic straw have been used as support media. Acclimatization of microorganisms was achieved by mixing wastewater sludge with packing materials in a container with a retention time of one week. Up-flow anaerobic fixed bed reactor (0.4 m length and 75 mm diameter) filled with supporting materials (height of 0.2 m) was evaluated by operating at different HRT (8h, 16h, 24h and 48h). The reactor packed with plastic straw as support media, relatively performed better at 48hr HRT. COD, BOD, total solids, TDS, phosphates and nitrates were reduced by 86%, 94%, 84%, 89%, 56% and 65% respectively. When the anaerobically treated wastewater was aerated for 24 hour for the removal of odour, a significant reduction in the concentration of routine parameters was observed. Anaerobic treatment along with aeration has shown reduction of BOD by 97%, COD by 91%, TS by 88% and TDS by 87% respectively.

***Keywords: Eco-friendly, Coffee processing wastewater, Anaerobic, Up-flow anaerobic reactor, Aeration***