

ANAEROBIC TREATMENT OF OLIVE MILL WASTEWATER AND PIGGERY EFFLUENTS FERMENTED WITH CANDIDA TROPICALIS

Abstract

Olive mill wastewater (OMW) contains high concentrations of phenolic compounds that are inhibitory to many microorganisms making it difficult to treat biologically prior to discharge in waterways. The total mono-cyclic phenol reduction in OMW in this study was carried out by aerobic pre-treatment using the yeast *Candida tropicalis* in a 18 L batch reactor at 30 °C for 12 days followed by anaerobic co-digestion. A COD removal of 62% and a reduction in the total mono-cyclic phenol content by 51% of the mixture was achieved in the aerobic pre-treatment. Pig slurry was added as co-substrate to supplement the low nitrogen levels in the olive mill wastewater. Subsequent anaerobic treatment was carried out in a 20 L fixed-bed reactor at 37 °C and HRT between 11 and 45 days. After a long start-up period, the OLR was increased from 1.25 to 5 kg COD m⁻³ day⁻¹ during the last 30 days, resulting in subsequent increase in overall COD removal and biogas production, up to maximum values of 85% and 29 L_{biogas} L_{reactor}⁻¹ da y⁻¹, respectively. Methane content of the biogas produced from the anaerobic digestion ranged between 65% and 74%.

Keywords: Olive mill wastewater; Aerobic fermentation; Anaerobic digestion; Bio-degradation; *Candida tropicalis*