



UASB TREATMENT OF FRUIT CANNING WASTEWATER: PILOT-SCALE INVESTIGATIONS

Vasileios Diamantis^{1*}, Eleni Pavlidou², Alexandros Aivazidis¹

¹ *Laboratory for Wastewater Management and Treatment Technologies, Department of Environmental Engineering, Democritus University of Thrace, Vas. Sofias 12, GR-67100, Xanthi, Greece.*

² *Laboratory of Scanning Microscope, Department of Physics, Aristotle University of Thessalonica, GR-54 124, Thessalonica.*

Abstract

A 6.5 L Upflow Anaerobic Sludge Bed (UASB) reactor was operated with an industrial fruit canning wastewater of fluctuating strength and characteristics (pH = 4-10, COD total = 940-5080 mg/L, COD soluble = 890-3900 mg/L) at 25-36 °C. The UASB reactor operated successfully at Hydraulic Residence Times (HRT) of 6-12 h and Organic Loading Rates (L_{RS}) between 4-16 kg/(m³d). Reactor start-up was performed within 2-3 d after seeding with granular sludge from an Expanded Granular Sludge Bed (EGSB) reactor. Effluent COD was constantly below 800 mg/L and correspondingly COD removal efficiency higher than 75 %. An increase in effluent COD was observed when the reactor was re-started after short term starvation (1-3 d) at high Organic Loading Rate [10-12 kg/(m³d)]. Biogas and methane selectivity were 0.37 L/g_{CODr} and 0.24 L_{CH₄}/g_{CODr} respectively. The UASB reactor proved to be an interesting option for the pre-treatment of wastewater from the fruit canning industry.

Keywords: anaerobic wastewater treatment, fruit canning industry, UASB, granular sludge, complex wastewater

* Author to whom all correspondence should be addressed: e-mail: bdiamant@env.duth.gr,
Tel./Fax: +30 25410 79376