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# World Multidisciplinary Earth Sciences Symposium

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## ABSTRACT COLLECTION BOOK

SEPTEMBER 11-15  
**2017**  
Prague - Czech Republic

**TREATMENT AND ENERGY VALORISATION OF AN AGRO-INDUSTRIAL EFFLUENT IN UPFLOW ANAEROBIC SLUDGE REACTOR (UASB)**

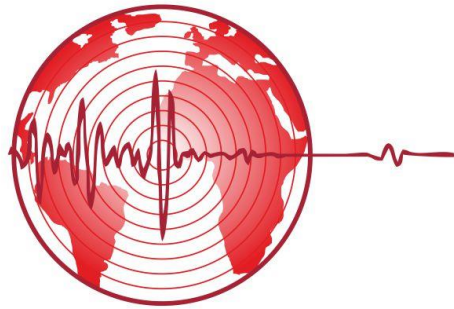
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**ABSTRACT**

The accelerated growth of the population brings with it an increase in the generation of agro-industrial effluents. The inadequate discharge of these effluents significantly affects the quality of water resources. In this way, it becomes important to invest in treatment processes for agro-industrial effluents, particularly low-cost ones. In this context, the present study includes the design and construction of a UASB reactor and optimization of the anaerobic digestion treatment of the raw effluent from chestnut production in the agro-industrial company Sortegel. The efficiency of the system was evaluated through the determination / monitoring of Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), biogas production rate and quality (% methane). The reactor was fed for 25 weeks and operated under mesophilic conditions (temperature 30-40°C). Different values were tested for the hydraulic retention time (HRT) and volumetric flow rate (QV): 0.66 days (QV=1509 L.m<sup>-3</sup>.d<sup>-1</sup>); 1.33 days (QV=755 L.m<sup>-3</sup>.d<sup>-1</sup>); 2.41 d days (QV=415 L.m<sup>-3</sup>.d<sup>-1</sup>). The average COD removal efficiency reached values of 69%, 82% and 75%, respectively, and simultaneously the associated CBO<sub>5</sub> removal efficiency was 84%, 91% and 70%. As regards TSS, removal values were 78%, 94% and 63%. In addition, high methane production rates were obtained, between 2500 and 4800 L CH<sub>4</sub>.kg<sup>-1</sup> COD removed.d<sup>-1</sup>. For all the hydraulic retention times tested, high concentrations of methane in the biogas were recorded: 66-75%, 70% and 75% for HRT of 0.66, 1.33 and 2.41 days, respectively.



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