Herbal pharmaceutical wastewater treatment by a pilot scale up flow anaerobic sludge blanket (UASB) reactor

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Abstract

Herbal pharmaceutical industry has grown tremendously in the last few decades. As such literature on the treatment of this wastewater is scarce. Water pollution control problems in the developing countries can be solved through application of cost effective aerobic / anaerobic biological systems. One such system is the UASB process, which is very cost effective with by product recovery applied to treatment of this wastewater in a pilot scale up flow anaerobic sludge blanket (UASB) reactor for a period of six months having a capacity of 27.44 m3 has been monitored and prove the performance of the reactor in treating this high strength wastewater. Studies were carried out at various organic loading rates varying between 6.26 and 10.33 kg COD/ m3/day and hydraulic retention time (HRT) fluctuated between 33 and 43 hours with chemical oxygen demand (COD), biochemical oxygen demand (BOD) and suspended solids (SS) removals in the range of 86.2% - 91.6%, 90.0% - 95.2% and 62.6% - 68.0% respectively. Where as biogas production varied between 0.32-0.47 m3/ kg COD added. Sludge from different heights of UASB reactor was collected and subjected to scanning electron microscopy (SEM) and results indicated good granulation with efficient performance of UASB reactor.