

Accepted Manuscript

Impact of mild alkali dosage on immobilized *Exiguobacterium spp.* mediated cost and energy efficient sludge disintegration.

J. Rajesh Banu, U. Ushani, M. Rajkumar, R. Naresh Kumar, O. Parthiba Karthikeyan

PII: S0960-8524(17)31530-4

DOI: <http://dx.doi.org/10.1016/j.biortech.2017.08.216>

Reference: BITE 18825

To appear in: *Bioresource Technology*

Received Date: 15 July 2017

Revised Date: 29 August 2017

Accepted Date: 31 August 2017



Please cite this article as: Rajesh Banu, J., Ushani, U., Rajkumar, M., Naresh Kumar, R., Parthiba Karthikeyan, O., Impact of mild alkali dosage on immobilized *Exiguobacterium spp.* mediated cost and energy efficient sludge disintegration., *Bioresource Technology* (2017), doi: <http://dx.doi.org/10.1016/j.biortech.2017.08.216>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Impact of mild alkali dosage on immobilized *Exiguobacterium spp.* mediated cost and energy efficient sludge disintegration.

J. Rajesh Banu^{a,*}, U. Ushani^a, M. Rajkumar^b, R. Naresh Kumar^{c,d} O. Parthiba Karthikeyan^e

^aDepartment of Civil Engineering, Regional Centre of Anna University, Tirunelveli, India

^bDepartment of Environmental Sciences, Bharathiar University, Coimbatore - 641 046, Tamil Nadu, India

^cDepartment of Civil and Environmental Engineering, Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India

^dSchool of Science, Edith Cowan University, Western Australia 6027, Australia

^eSino-Forest Applied Research Centre for Pearl River Delta Environment, Hong Kong

Abstract

Approaches to (extracellular polymeric substance) EPS removal were studied with major aim to enhance the biodegradability and sludge solubilization. In this study, a novel approach of entrapment of bacterial strain was carried out to achieve long term activity of protease secreting bacteria *Exiguobacterium sp.* A mild treatment of potassium hydroxide (KOH) was applied to remove EPS which was followed by entrapment under the biological pretreatment. The efficiency of *Exiguobacterium* was predicted through dissolvable organic and suspended solids (SS) reduction. The maximum dissolvable organic matter released was 2300 mg/L with the solubilization of 23% which was obtained for sludge without EPS (SWOE). For dissolvable organic release, SWOE showed higher final methane production of 232 mL/g COD at the production rate of 16.2 mL/g COD. d. The SWOE pretreatment was found to be cost effective and less energy intensive beneficial in terms of energy and cost (43.9 KWh and -8.2 USD) when compared to sludge with EPS (SWE) pretreatment (-177.6 KWh and -91.23USD).

Download English Version:

<https://daneshyari.com/en/article/4996775>

Download Persian Version:

<https://daneshyari.com/article/4996775>

[Daneshyari.com](https://daneshyari.com)