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Use of Bacillus spp in the bioremediation of fats, oils and greases (FOG's), and other waste substrates in food processing effluents

Roets-Dlamini, Yrielle; Moonsamy, Ghaneshre; Lalloo, Rajesh; Ramchuran, Santosh O

Abstract
Food production industries generate large amounts of untreated water-borne food wastes that accumulate and block drains and pipes, increasing life cycle operating costs. Food wastes contain high concentrations of protein, carbohydrates (sugars), and fats, causing a high nutrient load in the receiving water. Due to stringent waste disposal regulations and threats to water sustainability, these industries need viable waste treatment solutions. This study focused on augmenting food waste effluents using indigenous Bacillus organisms selected from a proprietary CSIR database. These microorganisms were screened for their constitutive enzyme production and other bioremediation markers. The biodegradation ability of selected isolates was tested individually and as mixed cultures using both synthetic and industrial food processing effluents. This study revealed that a consortium containing three microbial isolates, all identified as Bacillus cereus variants, demonstrated good bioremediation potential when used for the degradation of fats, oils, greases, and the reduction of odours.