

Recovery of curdlan from aerobic granular sludge wastewater treatment systems

Adedoyin Adekunle¹

The prospect of resource recovery from wastewater and its potential has gained attention over the past few years. A circular economy within wastewater treatment systems appears to give a promising future and potential collaboration between the waste, resource, and manufacturing sectors. The aerobic granular sludge (AGS) is an emerging biotechnology with a strong potential to revolutionize the wastewater management industry. Both municipal and different industrial wastewater streams have been successfully treated using AGS. In addition to efficient wastewater treatment, AGS provides the opportunity to recover valuable bioresources such as phosphorus, alginate-like exopolysaccharide (ALE), polyhydroxyalkanoates (PHAs), tryptophan, etc. Recently, curdlan, a neutral water-insoluble, biodegradable, non-toxic, bacterial exopolysaccharide, has been identified to be one of the resources that can be recovered from (AGS)-based wastewater treatment systems. Curdlan has numerous industrial applications including sources of bio-thickener, stabilizer, and texturizer in food industries as well as biomedical applications such as treatment of viral infections and improvement of human intestinal health. Current research is focused on the optimizing the biosynthesis of curdlan in AGS bioreactors during wastewater treatment and developing recovery protocols from AGS biosolids. The outcomes of this research will contribute to attaining the biorefinery concept in the wastewater management industry.

¹School of Engineering, University of Northern British Columbia, Prince George, B.C., V2N 4Z9, Canada.