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Author: Zane N. Norvill Andy Shilton Benoit Guieysse

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Emerging contaminant degradation and removal in algal wastewater treatment ponds: Identifying the research gaps

Zane N. Norvill, Andy Shilton, Benoit Guieysse*

School of Engineering and Advanced Technology, Massey University, Private Bag 11 222, Palmerston North 4442, New Zealand

* Correspondence author:

B.J.Guieysse@massey.ac.nz; Telephone: +64 6 350 5841; Fax: +64 6 350 5604

Highlights

- Indirect photodegradation mechanisms likely dominate over direct photolysis
- Algae can biodegrade some ECs in specific media, but data in wastewater is lacking
- Removal by sorption is usually low, except for very hydrophobic pollutants
- The effect of daily environmental variations upon EC removal has not been studied

Abstract

Whereas the fate of emerging contaminants (ECs) during 'conventional' and 'advanced' wastewater treatment (WWT) has been intensively studied, little research has been conducted on the algal WWT ponds commonly used in provincial areas. The long retention times and large surface areas exposed to light potentially allow more opportunities for EC removal to occur, but experimental evidence is lacking to enable definite predictions about EC fate across different algal WWT systems. This study reviews the mechanisms of EC hydrolysis, sorption, biodegradation, and photodegradation, applying available knowledge to the case of algal WWT. From this basis the review identifies three main areas that need more research

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