Occurrence, environmental risks and biological remediation mechanisms of Triclosan in wastewaters : Challenges and perspectives-

Nandikes, Gopa[a]; Pathak, Pankaj[a]; Razak, Abdul SyukorAbd[b]; Narayanamurthy, Vigneswaran[c, d]; Singh, Lakhveer[e, f]

[a] Department of Environmental Science, SRM University-AP, Andhra Pradesh, Mangalagiri, 522502, India

[b] Faculty of Civil Engineering Technology, Universiti Malaysia Pahang (UMP), LebuhrayaTunRazak, Gambang, Kuantan, 26300, Pahang, Malaysia

[c] Fakuti TeknoogiKejuruteraanElektrik Dan Elektronik, UniversitiTeknikal Malaysia, Hang Tuah Jaya, Durian Tunggal, 761000, Melaka, Malaysia

[d] Department of Biotechnology, Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Chennai, India

[e] Department of Chemistry, Sardar Patel University, Himachal Pradesh, Mandi, 175001, India

[f] Department of Civil Engineering, Centre for Research & Development, Chandigarh University, Punjab, Mohali, 140413, India

ABSTRACT

Triclosan (TCS) is an antimicrobial agent used widely in pharmaceutical and personal care products (PPCPs). The extensive use of TCS in PPCPs has increased over the past few decades and its sizeable production and consumption are causing adverse effects on the environment and humans. TCS has been made into the list of emerging micropollutants (EMPs) due to its omnipresence in water resources, and even in biological samples such as urine and breast milk. Therefore, it is imperative not only to understand the current status of TCS pollution, but their occurrence, exposure routes, and environmental risks to identify remediation technologies for mitigating TCS. Present review targets to provide the cumulative data on the abundance of emerging TCS in water resources and its associated health burdens, simultaneously. It is identified that TCS remediation can be achieved through advanced physical and chemical methods such as enzyme oxidation and ozonation. However, there are drawbacks such as high energy consumption and the formation of toxic by-products. Therefore, the article endeavors to provide an in-depth understanding of the biological remediation of TCS by microbial degraders as well as its superiority over other remediation techniques. Insights into the various microbial communities such as bacteria, algae, and fungi and their unique bioremediation mechanisms are comprehensively summarised. Moreover, challenges associated with existing bioremediation methods and future perspectives are also discussed in the present work.

KEYWORDS

Bioremediation; Microbial degradation; Micropollutants; Triclosan; Wastewater treatment

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