

[Book Chapter]

Iwamoto K* and Y. Shiraiwa (2016) Cesium accumulation by aquatic plants and algae. In: Impact of Cesium on Plants and the Environment. Dharmendra K. Gupta and Clemens Walther, Eds., Springer-Verlag. eBook: ISBN 978-3-319-41525-3; Hardcover: ISBN 978-3-319-41524-6 (due: October 24, 2016).

本書は、放射性セシウムに関する研究者によるその成果をまとめたもので、学生や研究者に対して放射能生態学 (radioecology) に関する科学的情報を提供するためのものである。1950年代、60年代の核実験、1986年のチェルノブイリ原発事故、そして2011年の福島原発事故により環境中に拡散した放射性セシウム(半減期30年)の除染は世界的な課題であり、関連する情報を成書として整理した意義は大きい。

本章では、2011年3月の東京電力福島第一原子力発電所の事故により環境中に拡散した放射性物質に関する情報と放射能汚染の現状を概説している。さらに、環境中に残存している放射性セシウム、ストロンチウム及びヨウ素の除染について、藻類・水生植物を利用するファイトレメディエーション技術に使用できる「放射性物質を吸収、蓄積」する能力を有する生物種のスクリーニングに関する研究成果をまとめたものである。







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D. Gupta, C. Walther (Eds.)
Impact of Cesium on Plants and the Environment

- ▶ Provides extensive and comprehensive knowledge to researchers and academicians working in the field of radiocesium contaminated sites
- ▶ Is a resource for graduate and undergraduate students specializing in radioecology or safe disposal of radiocesium contaminated waste, remediation of legacies and the impact on natural and man-made environment
- ▶ Covers recent advancements in radiocesium chemistry, how they enter into the natural environment, its impact on natural as well as man-made systems, and its ecological risk characterization for soil, plants and wildlife interaction

This book provides extensive and comprehensive knowledge to the researchers/ academics who are working in the field of cesium contaminated sites, and the impact on plants. This book is also helpful for graduate and undergraduate students who are specializing in radioecology or safe disposal of radioactive waste, remediation of legacies and the impact on the environment. Radiocesium (¹³⁷Cs and ¹³⁴Cs) was released into the environment as a result of nuclear weapons testing in 1950s and 1960s (~1x10¹⁸ Bq), and later due to the Chernobyl accident in 1986 (8.5x10¹⁶ Bq) and Fukushima Daiichi Nuclear Power Plant in 2011 (~1x10¹⁷ Bq). ¹³⁷Cs is still of relevance due to its half-life of 30 years. The study of radioisotope ¹³⁷Cs is important, as production and emission rates are high compared to other radioisotopes, due to high fission yield and high volatility.

This book contains original work and reviews on how cesium is released into the environment on translocation from soil to plants and further on to animals and into the human food chain. Separate chapters focus on the effective half-life of cesium in plants and on how different cultivars are responding in accumulation of cesium. Other key chapters focus on cesium impact on single cells to higher plants and also on remediation measures as well as on basic mechanism used for remedial options and analysis of transfer factors. The book rounds off by contributions on cesium uptake and translocation and its toxicity in plants after the Chernobyl and Fukushima accidents.



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