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## PHYTOREMEDIATION TECHNOLOGY FOR REMEDIATION OF RADIOSTRONTIUM ( $^{90}\text{Sr}$ ) AND RADIOCAESIUM ( $^{137}\text{Cs}$ ) BY *CATHARANTHUS ROSEUS* (L.) G. DON IN AQUATIC ENVIRONMENT

Singh Anamika <sup>1\*</sup>, Susan Eapen<sup>2</sup>, Madhusudan H. Fulekar<sup>1</sup>

<sup>1</sup>Environmental Biotechnology Laboratory, Department of Life Sciences, University of Mumbai, Santacruz (E), Mumbai- 400 098, India

<sup>2</sup>Nuclear Agriculture Biotechnology Division, Bhabha Atomic Research Centre, Trombay- 400 085 Mumbai, India

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### Abstract

Phytoremediation is an eco-friendly, cost effective, in situ treatment technology. In the present research study, phytoremediation technology has been employed for remediation of radionuclides namely  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  by using living green plant *Catharanthus roseus*. *C. roseus* plants were exposed to different activity levels of  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  in aquatic condition to assess the efficiency of plants for remediation of radionuclides. *C. roseus* plants have been found to remediate 70%, 52% and 44.7% of  $^{90}\text{Sr}$  when exposed to  $3.7 \times 10^2 \text{ kBqL}^{-1}$ ,  $3.7 \times 10^3 \text{ kBqL}^{-1}$  and  $3.7 \times 10^4 \text{ kBqL}^{-1}$  of  $^{90}\text{Sr}$  within a period of 15 days. The potential of *C. roseus* plants has also been studied for uptake of  $^{137}\text{Cs}$  at three different activity concentrations i.e.  $3.7 \times 10^2 \text{ kBqL}^{-1}$ ,  $3.7 \times 10^3 \text{ kBqL}^{-1}$  and  $3.7 \times 10^4 \text{ kBqL}^{-1}$  and found to remediate 73%, 59.3% and 51.3% of  $^{137}\text{Cs}$  within 15 days of experiment, respectively. The research findings proved that  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  are bioaccumulated by this weed plant and could be an ideal hyperaccumulator having potential for removal of radionuclides. The research findings highlight that radionuclides,  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  are remediated by *C. roseus* up to 73% and 70 % respectively, at higher activity level from the solutions. After remediation, this weed can be harvested, buried to ash and disposed off as waste in the safe environment.

*Key words:* bioaccumulation, radionuclides, translocation, uptake potential

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\* Author to whom all correspondence should be addressed: e-mail: [mhfulekar@yahoo.com](mailto:mhfulekar@yahoo.com)