

“BIOLUMINESCENT BACTERIAL STRAIN: AN EFFICIENT TOXICITY MARKER”**Arti Shanware, Neha Thakre****Keywords:** Bioluminescence, genes luxCDABE, luciferin, luciferase, environmental toxicity, toxicity marker**Corresponding Author:** Rajiv Gandhi Biotechnology Centre, L.I.T.Campus, Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur E-mail: thakre.neha@yahoo.com/ rtbiotech@rediffmail.com/ artishanware@gmail.com

Bioluminescence is comparatively infrequent in terrestrial ecosystems, but it is most often found in the marine environment. A marine organism which demonstrates bioluminescence includes Bacteria, Algae, Cnidaria, Annelids, Crustaceans, and Fish. Bioluminescence in general requires at least three major components: a substrate molecule known as a luciferin; a source of oxygen and a key catalytic enzyme known as a luciferase. From last few years, many researchers have been studying the physiology, biochemistry and genetic control of bacterial bioluminescence. These discoveries have transformed the research arena of Environmental Biotechnology & Microbiology through the use of luminescent genes for developing on-site monitoring tool for environmental studies. The present review reveals the concept of bacterial bioluminescence and the recent trends of bioluminescence in environmental toxicity studies. Biosensors based on luminescent bacteria are one of the emerging valuable toxicity biomarker to monitor the chemical quality and safety of surface and drinking water. In this review, an idea is offered of the recombinant strains comprising the bacterial luciferase genes luxCDABE with contaminant specific promoters, and which may be used as an online toxicity biomarker for water quality monitoring.