

## Study of Radiation Response in Lactobacillus Species

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**Abstract :** The small intestine epithelium is highly sensitive and major targets of ionizing radiation. Radiation causes gastrointestinal toxicity either by direct deposition of energy or indirectly (inflammation or bystander effects) generating free radicals and reactive oxygen species. Oxidative stress generated as a result of radiation causes active inflammation within the intestinal mucosa leading to structural and functional impairment of gut epithelial barrier. As a result, there is a loss of tolerance to normal dietary antigens and commensal flora together with exaggerated response to pathogens. Dysbiosis may therefore thought to play a role in radiation enteropathy and can contribute towards radiation induced bowel toxicity. Lactobacilli residing in the gut shares a long conjoined evolutionary history with their hosts and by doing so these organisms have developed an intimate and complex symbiotic relationships. The objective behind this study was to look for the strains with varying resistance to ionizing radiation and to see whether the niche of the bacteria is playing any role in radiation resistance property of bacteria. In this study, we have isolated the Lactobacillus spp. from probiotic preparation and murine gastrointestinal tract, both of which were supposed to be the important source for its isolation. Biochemical characterization did not show a significant difference in the properties, while a significant preference was observed in carbohydrate utilization capacity by the isolates. Effect of ionizing radiations induced by Co60 gamma radiation (10 Gy) on lactobacilli cells was investigated. A cellular survival curve versus absorbed doses was determined. Radiation resistance studies showed that the response of isolates towards cobalt-60 gamma radiation differs from each other and significant decrease in survival was observed in a dose-dependent manner. Thus the present study revealed that the property of radioresistance in Lactobacillus depends upon the source from where they have been isolated.

**Keywords :** dysbiosis, lactobacillus, mitigation, radiation

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