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# ADAPTATION OF PLANT GROWTH-PROMOTING BACTERIA (PGPB) TO DIFFERENT LEVELS OF IONIZING RADIATION FROM SOILS OF CHERNOBYL AND FUKUSHIMA.

**Abstract**

It is known that plants depend on abiotic (minerals, moisture, pH, electrical conductivity, etc.) and biotic (microorganisms and organic matter) factors to achieve stability, survival and growth. Plants establish relationships with a wide variety of microorganisms in order to get some benefits, such as the availability of essential nutrients like N, P and K.

PGPB are usually defined as microorganisms that can grow in, on, or around plant tissues, stimulating plant growth by a variety of mechanisms such as biological nitrogen fixation, phosphate solubilization and mineralization, siderophore production and synthesis of plant hormones. Microbial activity often depends on environmental conditions, and is altered by effects of pollution. One of the most aggressive and persistent polluting factors is ionizing radiation.

Due to nuclear disasters, radioactive contamination has affected hundreds of thousands of square kilometers worldwide with particularly strong effects documented in Chernobyl and Fukushima. Several information have been reported related to adverse effects on the environment that were triggered from two of the worst nuclear disasters in the world, Chernobyl (Ukraine) in 1986 and Fukushima (Japan) in 2011. However, to date, there are few published studies that have examined the high rates of mutation of bacteria in the soil of these two sites. Soil fauna, microbes and vegetation in areas chronically exposed to unusually high doses of radiation, develop specific physiological or genetic adaptations, which increase their radioresistance, and different levels of radiation could increase mutation rate of many organisms.

This research focuses on the study of PGPB that have been chronically exposed to different levels of ionizing radiation in this two sites. To do this, we are performing analysis at metagenomic, genomic, microbiological, morphological and biochemical levels.